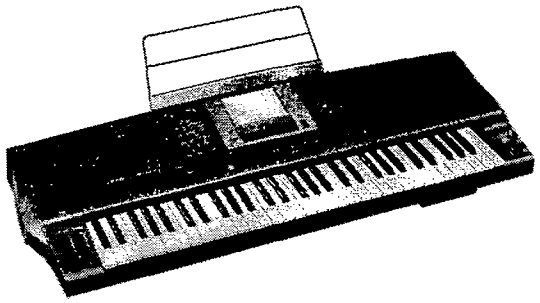
ORDER NO. EMID981695
A5

Service Manual

PCM Keyboard

SX-KN1600



(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW), (EA), (EP), (EK), (XL), (XR), (XS), (XD), (XT), (X), (XP), (XW)

AREAS

(M): U.S.A.	(EK): the United Kingdom
(MC): Canada	(XL): New Zealand
(XM): Mexico	(XR): Australia
(EN): Norway, Sweden, Denmark, Finland	(XS): Malaysia
(EH): Holland, Belgium	(XD): Hong Kong
(EF): France, Italy	(XT): Taiwan
(EZ): Germany	(X): Thailand, Indonesia, Panama, Venezuela, Ecuador, Colombia, Chile, Peru, Brasil
(EW): Switzerland	
(EA): Austria	
(EP): Spain, Portugal, Greece, South Africa	(XP): Philippines
	(XW): Singapore

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

■ Specifications

KEYBOARD		61 KEYS (WITH INITIAL TOUCH)
SOUND GENERATOR		PCM
MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY		64 NOTES
SOUNDS	NUMBER OF SOUNDS	256 SOUNDS + 13 DRUM KITS + 2 DIGITAL DRAWBARS
SOUNDS	SOUND GROUP	PIANO, GUITAR, STRINGS & VOCAL, BRASS, MALLET & ORCH PERC,ORGAN & ACCORDION, SAX & WOODWIND, SYNTH & DANCE, GM SPECIAL, BASS, DRUM KITS, DIGITAL DRAWBAR
SOUNDS	GM SOUNDS	128 NOTES
EFFECT		SUSTAIN, DIGITAL EFFECT, DSP EFFECT × 2, ACOUSTIC ILLUSION, DIGITAL REVERB
WHEEL		PITCH BEND, MODULATION
PART SELECT		RIGHT1, RIGHT2, LEFT
TRANSPOSE		G-C-F#
RHYTHMS	NUMBER OF RHYTHMS	128 RHYTHMS ×4 VARIATIONS
RHYTHMS	RHYTHM GROUP	8 & 16 BEAT, ROCK & POP, FUNK & SOUL, DANCE POP, BALLAD, SWING & JAZZ, USA TRAD, COUNTRY, MARCH & WALTZ, LATIN, WORLD
CONTROLS		MAIN VOLUME, BALANCE, MUTE, CONDUCTOR, START/STOP, INTRO & ENDING 1, INTRO & ENDING 2, FILL IN 1, FILL IN 2, COUNT INTRO, SYNCHRO & BREAK, TEMPO/PROGRAM, TAP TEMPO, FADE IN/OUT, SPLIT POINT
PERFORMANCE PADS		20 BANKS × 6 PADS WITH SOLO (USER BANK × 3 [STORAGE CAPACITY: APPROX. 3500NOTES], COMPILE BANKS × 2, CONTROL PRESET × 1) STOP/RECORD, AUTO SETTING
AUTO PLAY CHORD		MODE: ONE FINGER, FINGERED, PIANIST MEMORY, ON BASS, CHORD FINDER, LEFT HOLD
MUSIC STYLE ARRANGER		O
SOUND ARRANGER		O
MUSIC STYLIST		O
ONE TOUCH PLAY		O

Technics

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TECHNI-CHORD	○
PANEL MEMORY	3 BANKS × 8, SET, NEXT BANK, BANK VIEW
SEQUENCER	16 TRACKS RESOLUTION : 1/96 PER BEAT STORAGE CAPACITY : APPROX. 40000 NOTES (10 SONGS MAX.) INPUT MODES : EASY RECORD, REALTIME RECORD, STEP RECORD FUNCTIONS : CREATE, EDIT
COMPOSER	5 PARTS : BASS, ACCOMP 1, ACCOMP 2, ACCOMP 3, DRUMS STORAGE CAPACITY : APPROX. 10000 NOTES INPUT MODES : EASY COMPOSER, REALTIME RECORD, STEP RECORD FUNCTIONS : PATTERN COPY, SEQ TO COMPOSER COPY, LOAD SINGLE COMPOSER, BEND RANGE SET MEMORY : 3 BANKS×10 (VARIATION 1–4, INTRO 1, 2, FILL IN 1, 2, ENDING 1, 2)
DISK DRIVE	3.5 inch FLOPPY DISK DRIVE for 2HD (1.44 MB), 2DD (720 KB) LOAD, SAVE, DIRECT PLAY, SONG MEDLEY, DISK TOOLS, PREFERENCES, STYLE CONVERT
SOUND SETTING	PART SETTING, MIXER, MASTER TUNING, KEY SCALING, TECHNI-CHORD, REVERB & EQ PRESET, REVERB, EQUALIZER, DSP EFFECT, ACOUSTIC ILLUSION
SOUND EDIT	EASY EDIT, TONE SELECT, TONE LAYER, PITCH, FILTER, AMPLITUDE, DIGITAL EFFECT, CONTROLLER MEMORY: 40, 1 USER DRUM KIT
CONTROL	INITIAL, OVERALL TOUCH SENSITIVITY, FOOT CONTROLLERS, DISPLAY TIME OUT, PANEL MEMORY MODE, MUSIC STYLE ARRANGER MODE, FADE IN/OUT SETTING
MIDI	PART SETTING, CONTROL MESSAGES, REALTIME MESSAGES, COMMON SETTING, INPUT/OUTPUT SETTING, MIDI PRESETS, SYSEX BULK DUMP, GENERAL MIDI, PROG. CHANGE MIDI OUT, P. MEM OUTPUT, COMPUTER CONNECTION, MIDI SETTINGS LOAD OPTION
DISPLAY	LCD PAGE, CONTRAST, EXIT, DISPLAY HOLD
HELP	○
DEMO	○
TERMINALS	PHONES, FOOT SW, EXP PEDAL, LINE OUT (R/R+L, L), AUX IN (R/R+L, L), COMPUTER, MIDI (IN, OUT)
OUTPUT	30 W (15 W × 2)
SPEAKERS	12 cm×2, 6.5 cm×2
POWER REQUIREMENT	65 W AC120/220/240 V 50/60 Hz AC120 V 60 Hz (NORTH AMERICA AND MEXICO) AC230-240 V 50/60 Hz (EUROPE, AUSTRALIA, NEW ZEALAND, SINGAPORE AND PHILIPPINES)
DIMENSIONS (W × H × D)	105.7 cm×16.2 cm×40.4 cm (41-5/8"×6-3/8"×15-29/32")
NET WEIGHT	11.3kg (25 lbs)
ACCESSORIES	AC CORD, MUSIC STAND, STYLE CONVERT DISK

•Specifications are subject to change without notice for further improvement.

WARNING

To prevent the risk of fire, smoke, or electrical shock and to ensure safe operation, please be sure to follow the safety guidelines below.

1. At places where special caution is required, the necessary safety precautions are clearly labeled or printed, for example, on the cabinet, or on the part concerned. Please follow these safety precautions, and also those listed in the Owner's Manual.

2. Parts which have a ⚠ mark in the circuit diagram or in the parts list are essential for safety. When replacing these parts, be sure to use only the specified parts.

3. Use the specified types for internal wiring (double-insulated wiring, etc.).

4. When replacing parts on the AC primary side (power transformer, electric switch, electrical cord, noise-prevention condenser, etc.), wind the lead wire and secure it by soldering.

5. Do not let the wiring come into contact with heat-emitting devices (fuse resistor, radiator plate, etc.).

6. When replacing the wiring, make sure that it is not in contact with the unfinished or rough edge of a part.

7. When replacing the power cord (except for the plug-in type), tug it from various directions to confirm that it does not slip out of place.

8. Spacing
   If soldering was done on the AC primary circuit, confirm that the interval between the soldered terminals or between the terminal and surrounding metallic parts is at least the minimum required (between the primary circuit and the chassis: at least 6.5 mm; between primary circuit terminals: at least 4.0 mm; between primary circuit terminals and secondary circuit terminals: at least 6.5 mm).

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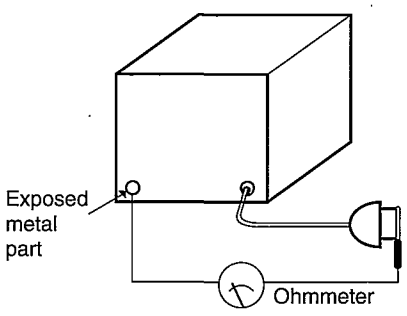
SAFETY PRECAUTION

● Safety Precaution

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

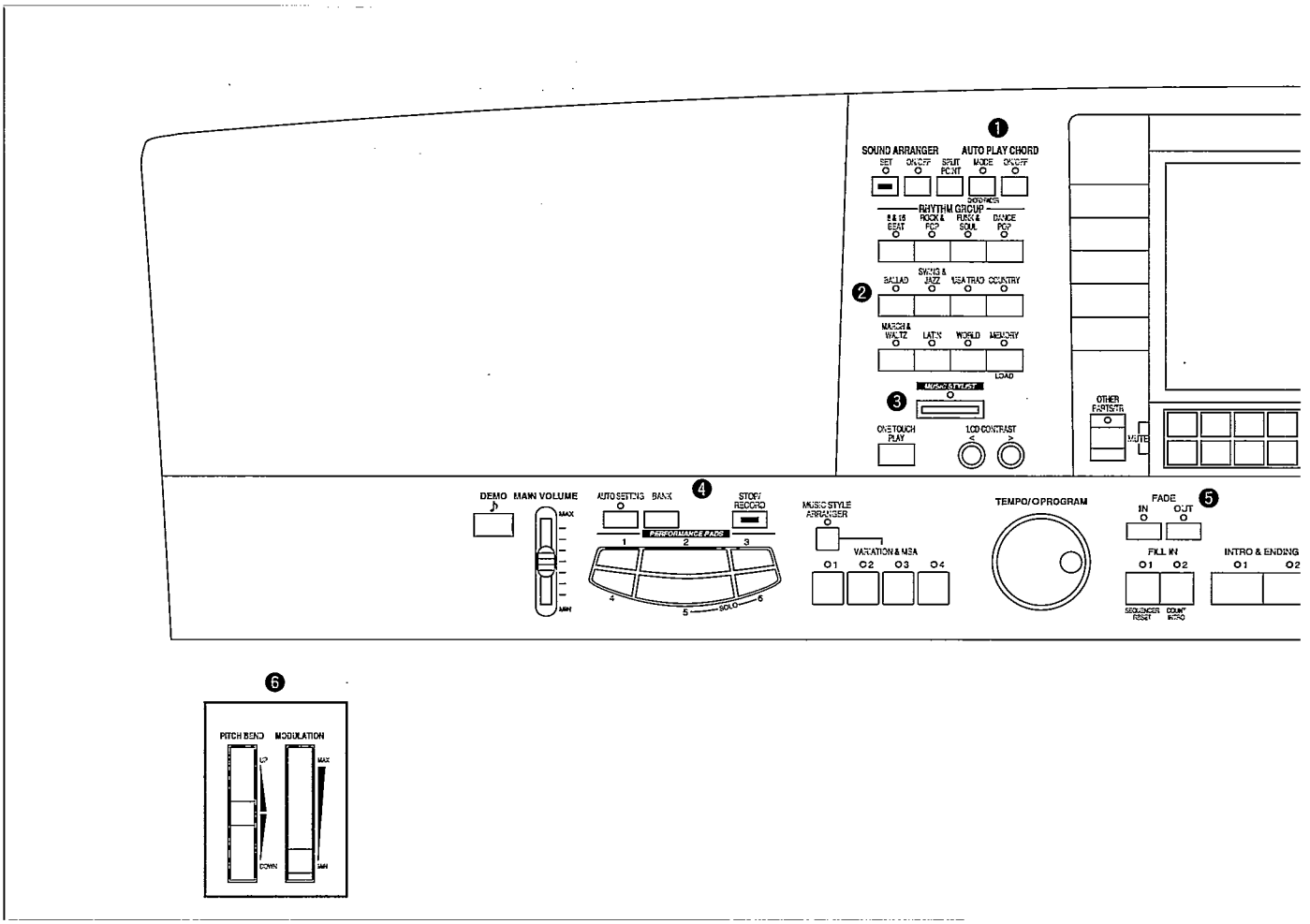
● Insulation Resistance Test

1. Unplug the power cord and short the prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw heads, connectors, control shafts, handle brackets, etc. Measurements should range from 4 MΩ to infinity for all exposed parts.



Resistance = 4MΩ to ∞

ARRANGEMENT OF CONTROL PANEL



❶ AUTO PLAY CHORD
Add an automatic accompaniment to your selected rhythm.

❷ RHYTHM GROUP
Various rhythm patterns are available for each rhythm group.

❸ MUSIC STYLIST
You can choose to have all the settings of this instrument automatically set.

❹ PERFORMANCE PADS
Add various phrases to your performance with the pad buttons.

❺ FADE IN/OUT
Begin your song with a slowly increasing volume, or end it by having the sound slowly fade away.

❻ PITCH BEND/MODULATION
The PITCH BEND wheel allows a "sliding" change in the pitch. The MODULATION wheel is used to add vibrato to the sound.

❼ DISPLAY
Displays performance information, function settings and other messages.
- Use the LCD CONTRAST buttons to adjust the display so that it is easy to read.

❽ EFFECT
Add various effects to the sounds.

❾ SOUND GROUP
Various sounds are available for each sound group.

❿ TRANSPOSE
Raise or lower the key of the entire keyboard.

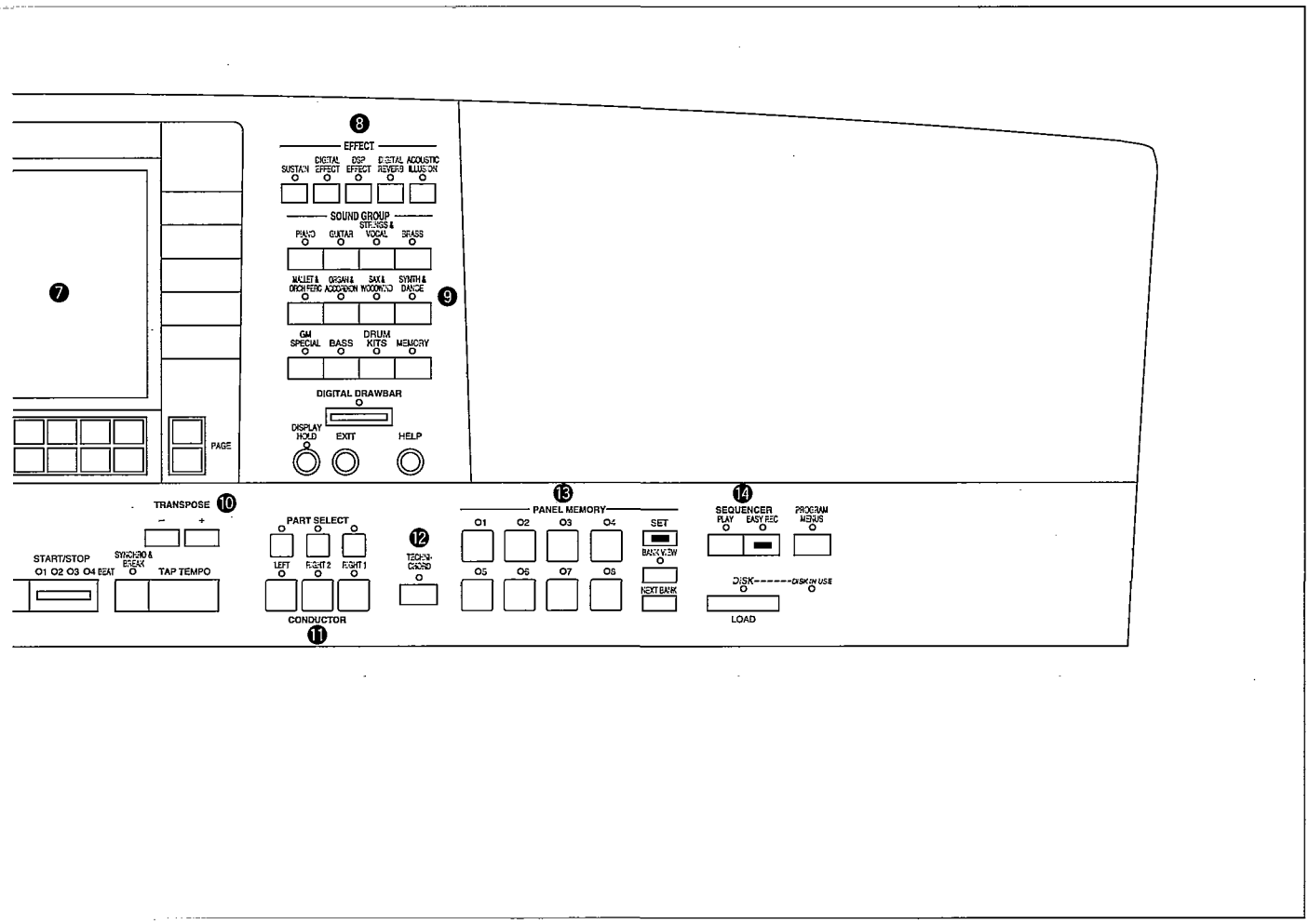
⓫ CONDUCTOR
Assign a different sound to each part, then assign the desired parts to sections of the keyboard.

⓬ TECHNI-CHORD
Block chords are automatically added to the melody.

⓭ PANEL MEMORY
Store the panel settings, then recall them instantaneously just by pressing a button or two.

⓮ SEQUENCER
Record and play back your performance.

Tuning
Unlike an acoustic piano, KN series PCM Keyboard never needs tuning.
The pitch of this instrument can be adjusted for when playing along with other instruments.



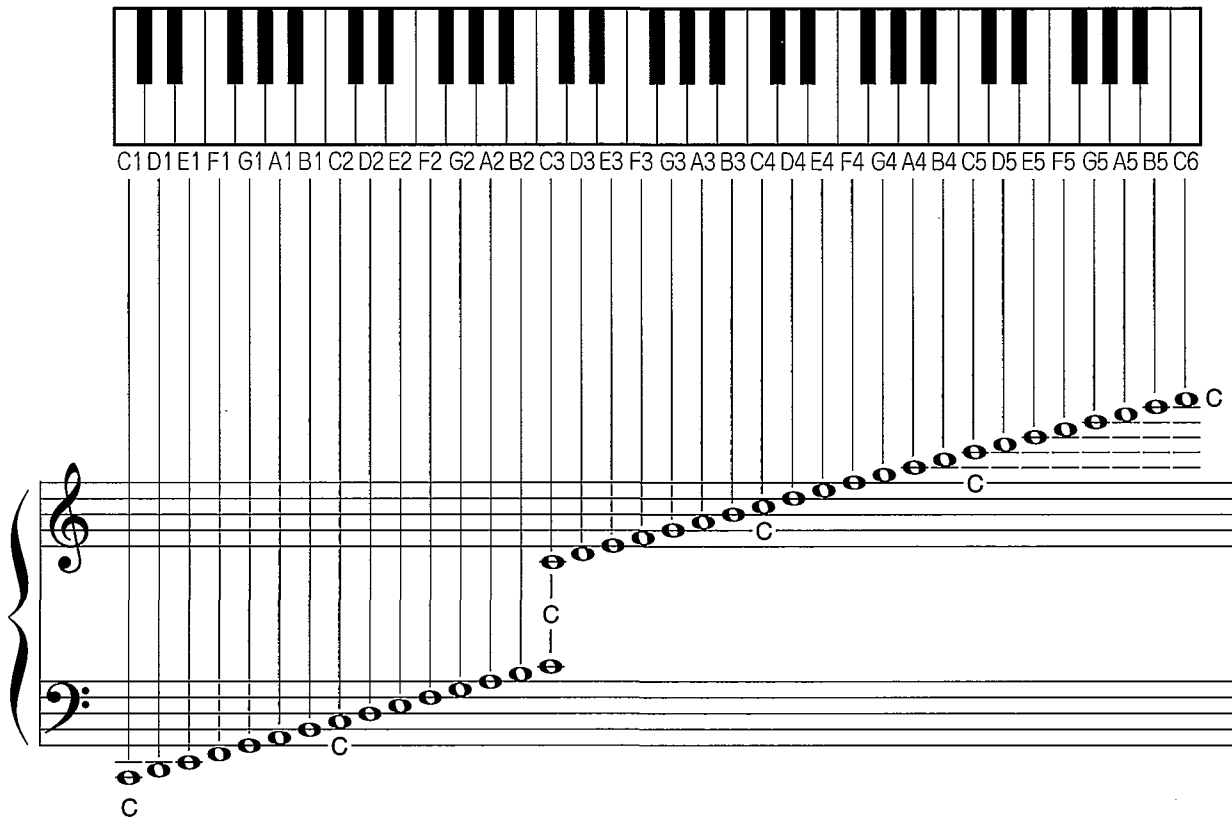
About the backup memory and performance data

When the power to this instrument is turned off, the various settings and memory contents of this instrument are maintained in the backup memory as folows:

BACKUP	PERFORMANCE	CURRENT PANEL settings	about 80 minutes
		PANEL MEMORY	
		SEQUENCER	
		COMPOSER (MEMORY contents)	
		SOUND MEMORY	
		PADS (USER memories of the **PERFORMANCE PADS**)	
		USER MIDI SETTINGS (USER memories for the MIDI PRESETS)	idenfinitely

- When GENERAL MIDI is ON (the logo is shown on the normal display), the CURRENT PANEL and SEQUENCER data are lost when the power is turned off.
- If you wish to retain the settings and stored memory contents for recall at a later time, store the desired data on a floppy disk.
- Except for the LCD CONTRAST, HELP (language selection), SOLO PIANO TYPE, MIDI USER PRESET, MIDI SETTING LOAD OPTION, DISPLAY TIMEOUT, and PREFERENCE (DISK) settings, the backup memory does not function for the stored contents until the power has been on for about 10 minutes.
- MIDI SYSEX deals only with the PERFORMANCE data.
- Data from previous Technics models are limited to PERFORMANCE data.

KEYBOARD RANGES



INITIAL SETTING

The following procedure resets all programmable settings, functions and memories to their initialized (factory-preset) status. Use this procedure if the buttons, keys, etc. malfunction, or when you wish to reset the memories and functions.

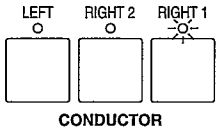
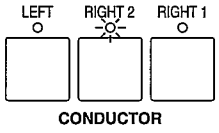
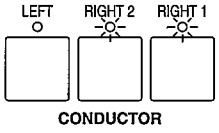
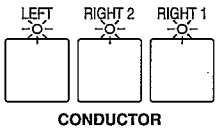
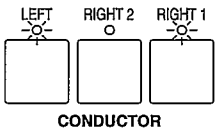
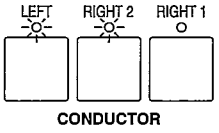
1. Turn off the **POWER** button.
2. While pressing the three lower left buttons in the **RHYTHM GROUP** section (**MARCH & WALTZ**, **LATIN** and **WORLD**) at the same time, turn the **POWER** button on again.

NOTE:
All stored data in the **SEQUENCER** and **COMPOSER** and other user settings (excluding USER MIDI SETTINGS, HELP (language selection) and LCD CONTRAST) will be deleted with this operation.

CONDUCTOR SETTINGS

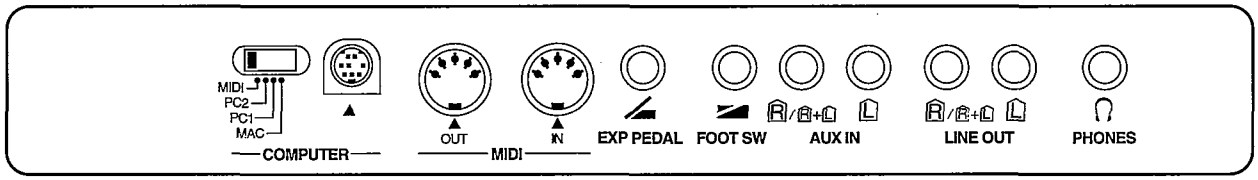
The **CONDUCTOR** buttons are used to assign the parts (**RIGHT 1**, **RIGHT 2**, **LEFT**) to the keyboard in many different ways. For example, you can even split the keyboard into right and left sections (**SPLIT**), and assign a different sound to each section.

CONDUCTOR

CONDUCTOR settings	How sounds are assigned to the keyboard
	All keys produce the **RIGHT 1** sound. **RIGHT 1**
	All keys produce the **RIGHT 2** sound. **RIGHT 2**
	All keys produce both the **RIGHT 1** sound and the **RIGHT 2** sound. **RIGHT 1 + RIGHT 2**
	The left keys produce the **LEFT** sound and the right keys produce the **RIGHT 1** sound and the **RIGHT 2** sound. **LEFT** / **RIGHT 1 + RIGHT 2**
	The left keys produce the **LEFT** sound and the right keys produce the **RIGHT 1** sound. **LEFT** / **RIGHT 1**
	The left keys produce the **LEFT** sound and the right keys produce the **RIGHT 2** sound. **LEFT** / **RIGHT 2**

TERMINALS

(on the rear panel)



EXP PEDAL
The optional SZ-E2 Expression Pedal (sold separately) can be connected to this terminal to control the volume.

FOOT SW
An optional SZ-P1 Foot Switch (sold separately) can be connected to each terminal to control various functions.

AUX IN (input level 0.5 Vrms, 6 kΩ)
Other instruments such as a sound generator can be connected to this terminal, and the sound will be output from this instrument's speakers. To receive monaural sound, connect the other instrument to the **R/R+L** terminal. (Do not connect the **L** terminal.)

LINE OUT (output level 1.5 Vrms, 600 Ω)
By connecting an external high-power amplifier, the sound can be reproduced at a high volume. To output monaural sound, connect the external equipment to the **R/R+L** terminal. (Do not connect the **L** terminal.)

MIDI
These terminals are for connection to another MIDI instrument.

PHONES
Headphones can be connected to this instrument.
- When headphones are plugged into this jack, the speakers of this instrument are disabled.

COMPUTER
By connecting this terminal to the serial port of a computer, performance data can be exchanged. Use the switch to select the type of computer.
- Be sure that the power to this instrument is turned off when connecting to a computer or when changing the switch setting.

> **Caution:**
> Failure to turn off the power before changing the switch setting may result in malfunction.

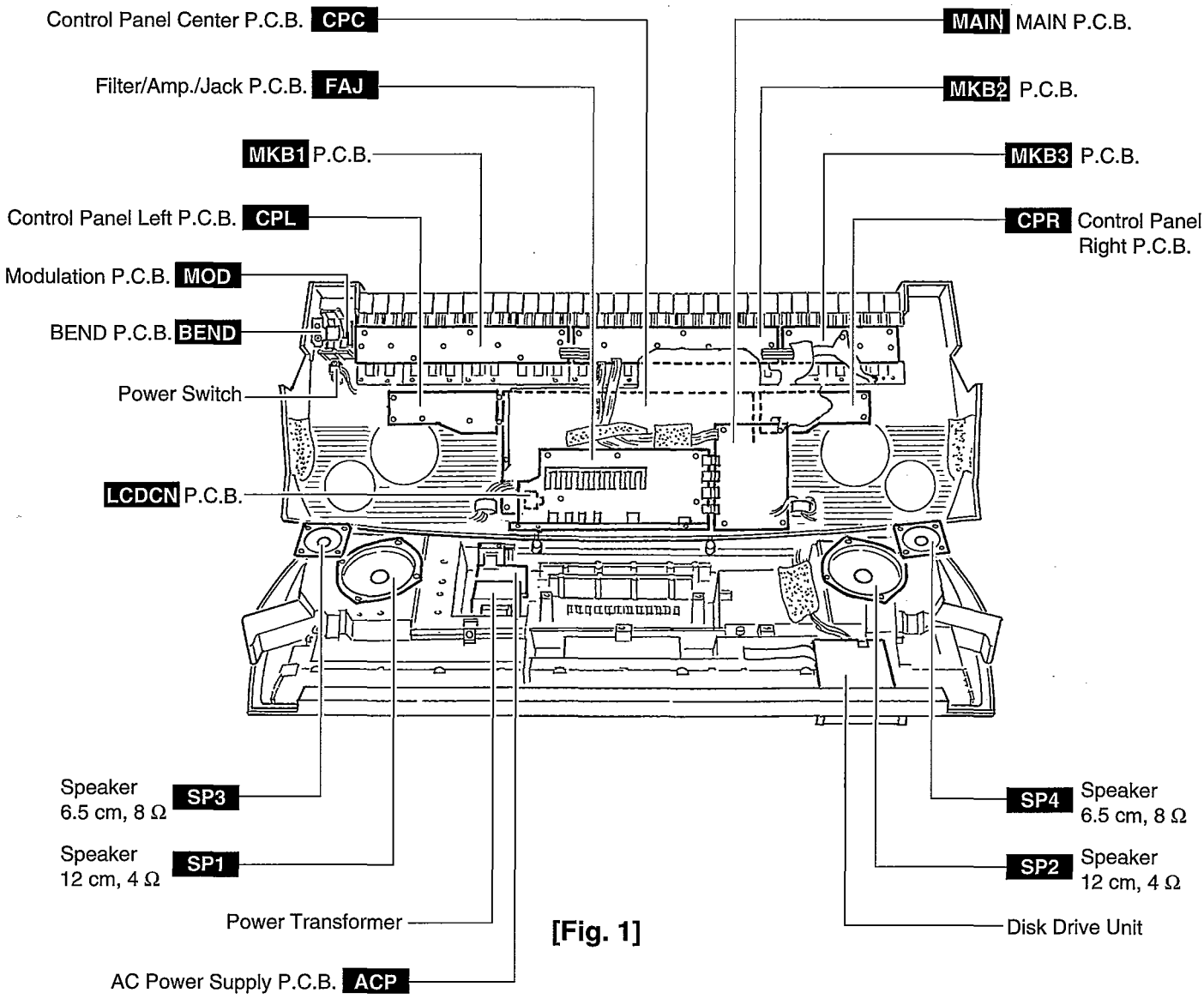
- When no computer is connected, or when a MIDI interface is used, the switch should be set to MIDI.

Connection to a Macintosh series computer
Use an ACCESSORY CABLE (SZ-JJAP1: sold separately) to connect the **COMPUTER** terminal of this instrument to the modem port or printer port of a Macintosh Series computer. Set the switch to **MAC**.
- *Set the MIDI interface clock of the Macintosh software to 1* MHz.
- Do not remove the core at either end of the cable.

Connection to a PC
Use an ACCESSORY CABLE (SZ-JJAT1: sold separately) to connect the **COMPUTER** terminal of this instrument to the RS232C terminal of a PC. Set the switch to **PC2**.
- The MIDI driver included with the cable should be installed in the computer. (Refer to the manual accompanying the cable.)
- Do not remove the core at either end of the cable.

* All product and company names are trademarks or registered trademarks of thier respective owners.

PARTS LOCATION

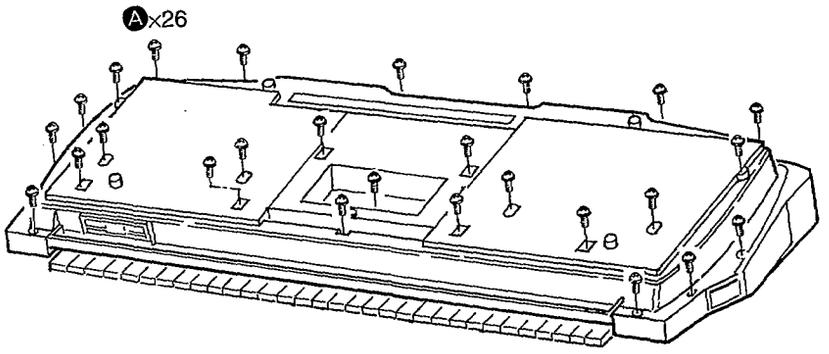


[Fig. 1]

DISASSEMBLY INSTRUCTIONS

1 Opening the cabinet

1. Turn the keyboard upside down as shown in Fig. 2 and remove the top cabinet mounting screws (Ⓐ 26 pcs.).
2. Place the keyboard bottom-side down and open the cabinet.



[Fig.2]

2 Removing the MAIN and FAJ P.C.B.s

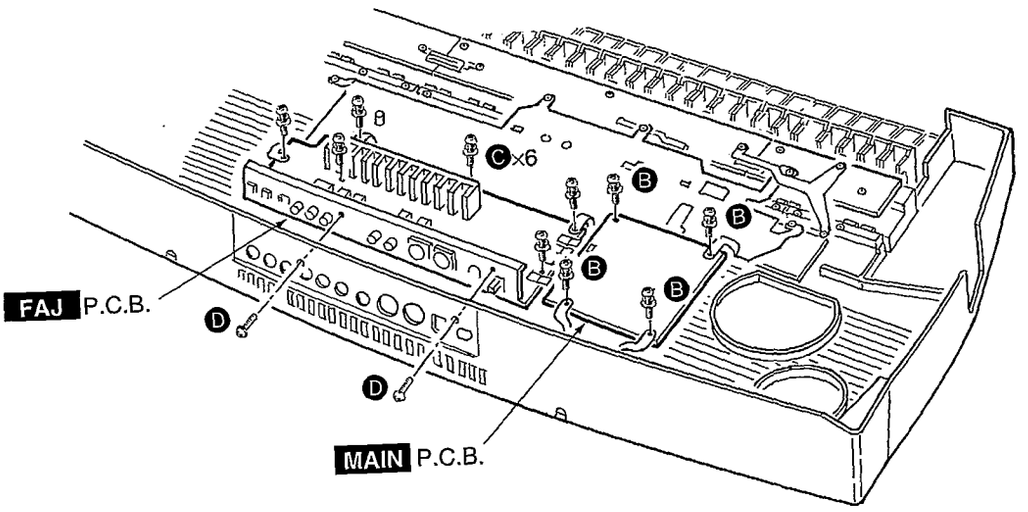
- Open the cabinet (see step 1).

MAIN P.C.B.

1. Remove the MAIN P.C.B. mounting screws (Ⓑ 4 pcs.).

FAJ P.C.B.

1. Remove the FAJ P.C.B. mounting screws (Ⓒ 6 pcs. and Ⓓ 2 pcs.).



[Fig.3]

3 Removing the CPC, CPL and CPR P.C.B.s and LCD

- Remove the MAIN and FAJ P.C.B.s (see step 2).
- Remove the shield cover mounting screws (Ⓔ 10 pcs.) and remove the shield cover.

CPC P.C.B.

1. Pull out the TEMPO/PROGRAM dial.
2. Remove the CPC P.C.B. mounting screws (Ⓕ 17 pcs.).

CPL P.C.B.

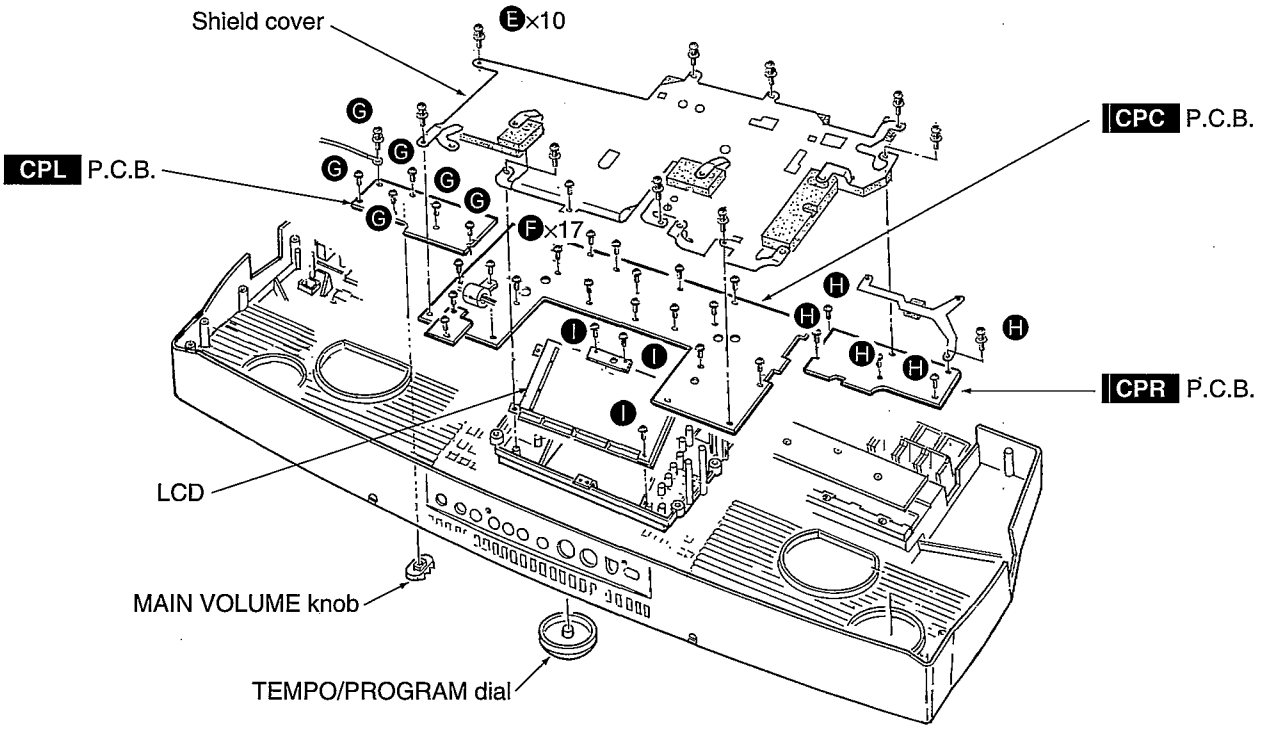
1. Pull out the MAIN VOLUME knob.
2. Remove the CPL P.C.B. mounting screws (Ⓖ 6 pcs.).

CPR P.C.B.

1. Remove the CPR P.C.B. mounting screws (Ⓗ 5 pcs.).

LCD

1. Remove the CPC P.C.B.
2. Remove the LCD mounting screws (Ⓘ 3 pcs.).



[Fig.4]

4 Removing the MKB1, MKB2, MKB3, MOD and BEND P.C.B.s

- Open the cabinet (see step 1).

MKB1 P.C.B.

1. Remove the MKB1 P.C.B. mounting screws (J 6 pcs.).

MKB2 P.C.B.

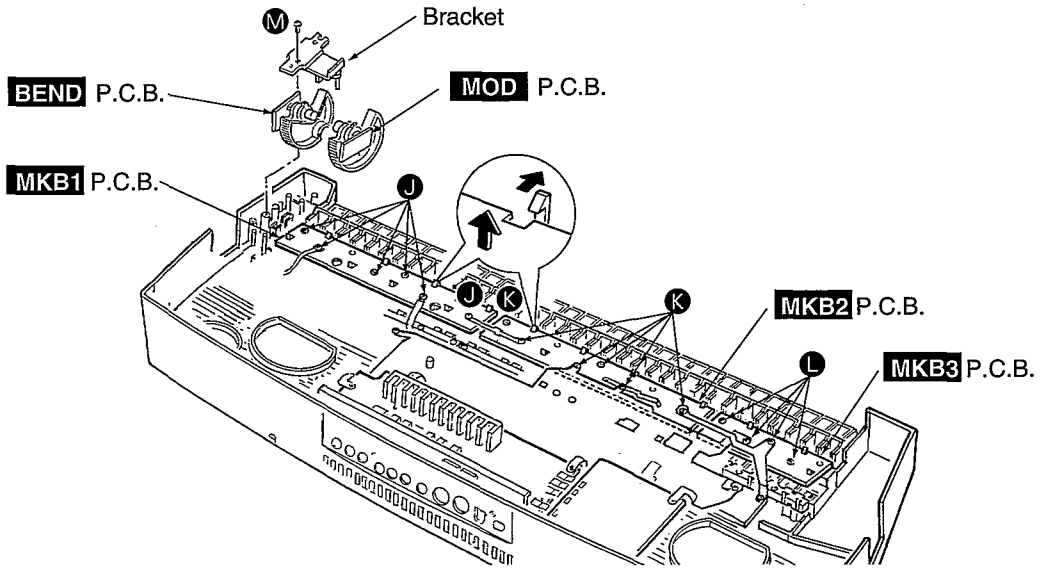
1. Remove the MKB2 P.C.B. mounting screws (K 6 pcs.).

MKB3 P.C.B.

1. Remove the MKB3 P.C.B. mounting screws (L 4 pcs.).

MOD and BEND P.C.B.s

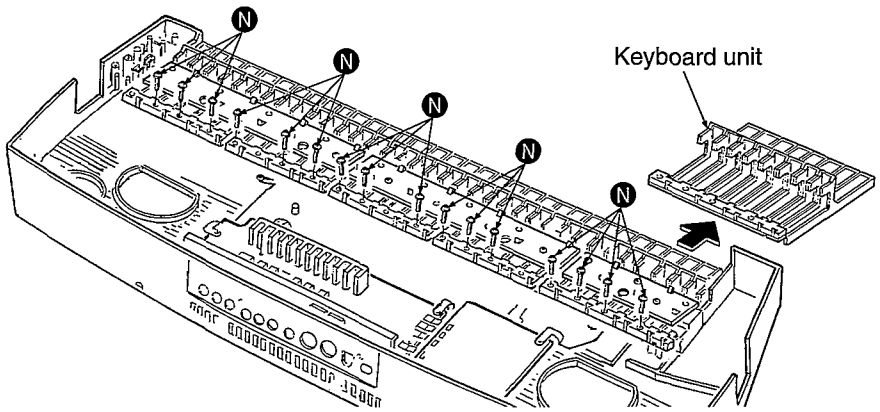
1. Remove the bracket mounting screw (M 1 pc.).
2. Pull out the MOD or BEND P.C.B. from the cabinet.



[Fig.5]

5 Removing the keyboard unit

1. Open the cabinet (see step 1).
2. The keyboard consists of 5 units. These units can be removed independently by removing the mounting screws (N 3 or 4 pcs. for each unit).



[Fig.6]

6 Removing the ACP P.C.B.

ACP P.C.B.

1. Open the cabinet (see step 1).
2. Remove the bracket mounting screws (O 2 pcs.).
3. Remove the ACP P.C.B. mounting screws (P 2 pcs.).

7 Removing the Disk Drive unit

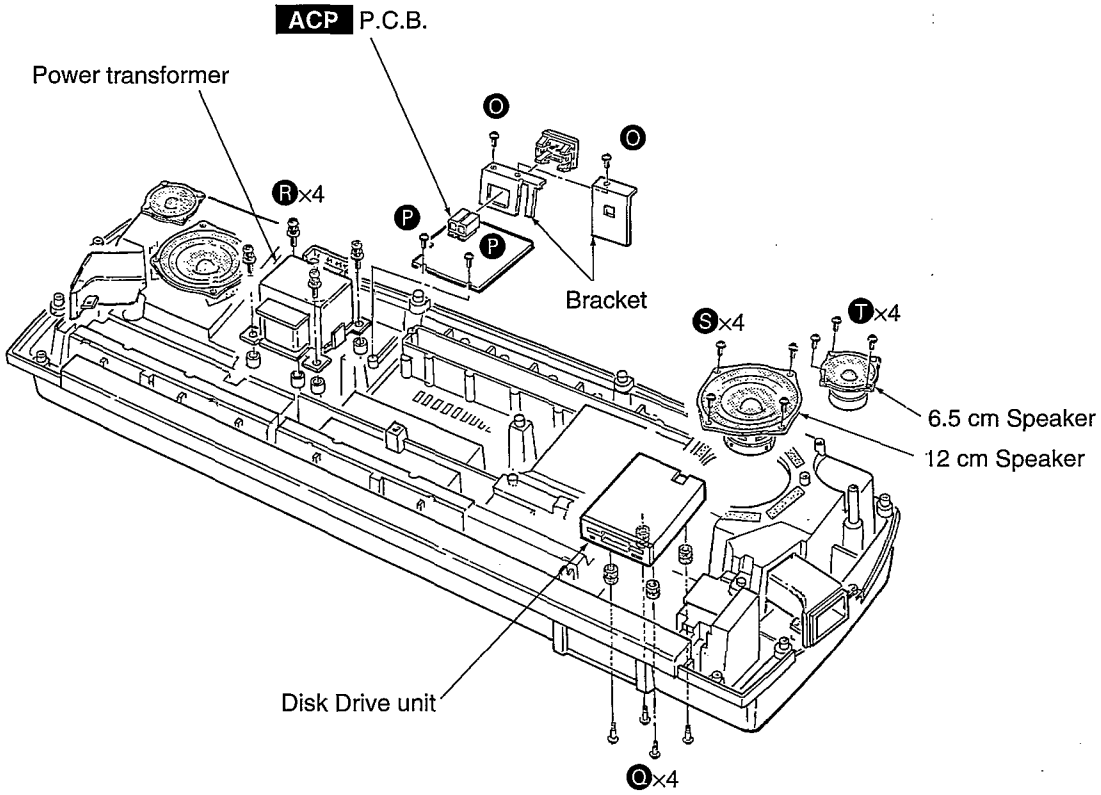
1. Open the cabinet (see step 1).
2. Remove the Disk Drive unit mounting screws (Q 4 pcs.).

8 Removing the power transformer

1. Open the cabinet (see step 1).
2. Remove the power transformer mounting screws (R 4 pcs.).

9 Removing the speakers

1. Open the cabinet (see step 1).
2. Remove the 12 cm speaker mounting screws (S 4 pcs.).
3. Remove the 6.5 cm speaker mounting screws (T 4 pcs.).



[Fig.7]

SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

The following changes in performance may occur in this instrument but do not indicate trouble.

	Phenomenon	Remedy
Sounds and effects	The buttons, keys, etc. malfunction.	• Turn off the **POWER** button once, then turn it on again. If this procedure is not successful, turn off the **POWER** button once. Then, while pressing the three lower left buttons in the **RHYTHM GROUP** section (**MARCH & WALTZ**, **LATIN** and **WORLD**) at the same time, turn the **POWER** button on again. (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.)
	No sound is produced when the keys are pressed.	• The **MAIN VOLUME** is at the minimum setting. Adjust the volume with the **MAIN VOLUME** control. • The volumes for the selected parts are set to the minimum levels. Use the balance buttons to set the volumes of the relevant parts to appropriate levels. • The part is muted. • The LOCAL CONTROL for a part performed on the keyboard is set to OFF. Set the LOCAL CONTROL to ON.
	Only percussive instrument sounds are produced when the keyboard is played.	• In the **SOUND GROUP** section, the **DRUM KITS** button is on.
	The volume is very low when the keyboard is played.	• The volume setting in the **SEQUENCER** contents is very low. Follow the INITIAL procedure to reset the settings.
	Some sounds cannot be selected.	• When the GENERAL MIDI status is set to ON, The sounds which can be selected and operation which can be executed are limited. Turn the GENERAL MIDI status OFF to return the instrument to its normal operation.
	The sound you hear is different from the sound you selected.	• This sometimes occurs when you play back **SEQUENCER** or **COMPOSER** data which was created on a different model, or when MIDI data is received from a connected instrument. Select the desired sounds again.
Rhythm	The rhythm does not start.	• The **DRUMS** volume is set to the minimum level. Use the balance buttons to set the **DRUMS** volume to an appropriate level. • A **SEQUENCER PLAY** button is on. When you are not playing back the **SEQUENCER** performance, turn off the **SEQUENCER PLAY** button. • CLOCK is set to MIDI. Set CLOCK to INTERNAL. • The rhythm does not work when the GENERAL MIDI mode is set to ON. Turn the GENERAL MIDI status OFF to return the instrument to its normal operation.
AUTO PLAY CHORD	No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced.	• An **ACCOMP** part does not sound if its corresponding volume is set to the minimum level. Use the respective balance buttons to set the **ACCOMP 1**, **2** and **3** volumes to appropriate levels.

	Phenomenon	Remedy
SEQUENCER	Storage is not possible.	• The remaining memory capacity of the **SEQUENCER** is 0. Follow the SONG CLEAR or TRACK CLEAR procedure to erase the memory.
	The playback measure indication is different from when the performance was recorded.	• The number of measures corresponds to the time signature of the rhythm selected at the start of recording. To change the rhythm in the middle of the song, record the rhythm change in the RHYTHM part.
COMPOSER	Storage is not possible.	• The remaining memory capacity of the **COMPOSER** is 0.
	Setting the time signature and number of measures is not possible.	• The time signature and number of measures cannot be changed for a pattern which is currently recorded in the **COMPOSER**. If you wish to change the time signature and/or measure data, first follow the procedure to clear the memory.
	The playback timing of the rhythm pattern is different from the timing with which it was recorded.	• The QUANTIZE function was on when the pattern was recorded and the timing was automatically corrected. Set the quantize level to a smaller note unit or to OFF when recording.
Disk Drive	The Disk Drive produces a noise during recording or playback.	• This occurs when the Disk Drive is reading a disk. It does not indicate a problem.
	When the procedure to load from a disk is performed, the contents of the keyboard memory are erased.	• When performing the load operation from a disk, the keyboard memory changes to that of the data loaded from the disk. If you wish to preserve a song which is stored in the keyboard memory, save it on a disk before performing the load procedure.
MIDI	Data cannot be exchanged through MIDI terminals.	• The switch for the **COMPUTER** terminal is not set to **MIDI**. Turn off the power to this instrument and set the switch to **MIDI**. (Refer to page 181.) • Match the channels on the transmitting side and the receiving side.
	The sound quavers or is distorted.	• When the **COMPUTER** terminal or both the **MIDI IN** and **OUT** terminals are connected to a computer, depending on the computer software the received data may be sent back to the instrument just as it is. Because of this the sound generated from the keys and the sound generated from the returned data are both produced, causing undesirable effects, such as the sounds canceling each other out, for example. In this case, either change the software settings to prevent received data from being returned, or set the MIDI LOCAL CONTROL to off.
Other	Noise from a radio or TV can be heard.	• This sometimes occurs when electrical equipment such as a radio or TV is used near the instrument. Try moving such electrical equipment further away from the instrument. • The sound may be coming from a nearby broadcast station or amateur radio station. If the sound is bothersome, consult your dealer or service center.
	The cabinet becomes warm during use.	• This instrument has a built-in power source that heats the cabinet to some degree. This is not an indication of trouble.

ERROR DISPLAY

No.	Contents
00	The data on the disk that you are using is for a different product.
01*	An error has occurred while the disk was loading. Please try again!
02	There is no disk in the Disk Drive.
03	The file that you tried to load is empty.
05	An error has occurred while the disk was saving. Please try again!
06	The disk that you are using is write protected. Please remove the write protection and try again.
07	The disk that you are using is full. Please use another disk.
08	An error has occurred while the disk was formatting. The disk that you are using may be faulty. Please try formatting another disk.
10	The data is already copy protected.
15	The song you are trying to save is empty.
16	This STANDARD MIDI FILE is incompatible with this instrument and cannot be loaded.
17	This is not a STANDARD MIDI FILE.
18	The timebase (PPQ resolution) that you tried to load is not 24/48/96/192/288/384 PPQ.
19	This is a FORMAT 1 MIDI FILE disk and cannot be played back.
20	A problem has occurred with your **SEQUENCER** Data. This might be due to a damaged or faulty disk.
21	Memory full
22	It is necessary to press PUNCH OUT to complete this procedure.
23	It is impossible to change the time signature because it has already been set in the existing tracks.
24	A rhythm track already exists. It is impossible to assign two tracks to rhythm.
25	It is only possible to change the velocity on a melody track.
26	It is only possible to merge melody tracks. Tracks such as rhythm, chord and control cannot be merged.
27	It is only possible to copy melody tracks. Tracks such as rhythm, chord and control cannot be copied.
28	This song is too long to be saved as a MIDI file.

No.	Contents
29	The MIDI file that you have tried to load exceeds the memory capacity of this instrument and cannot be played. The **SEQUENCER** memory has been cleared.
30	It is not possible to change the time signature or measure length of a **COMPOSER** pattern after it has been recorded. If you want to proceed, you must first clear the entire **COMPOSER** pattern.
31	The time signature of the pattern from which you are copying is different from the **COMPOSER** memory that you are using. Either: Change the time signature of the **COMPOSER** memory or: Copy from a pattern that has the same time signature
32	Memory full
33	Select a Track before setting parameters for AUTO PUNCH RECORD.
40	The Identification (ID) code of the system exclusive data received by this instrument is for a different product.
41	An error has occurred during system exclusive data reception. The data from the transmitting device may be incomplete. Please try again.
42	An error has occurred during system exclusive transmission. The data has not been received correctly. Please try again.
43	The file that you are trying to load was saved on a previous KN keyboard. It is only possible to load using the "PERFORMANCE" option.
46	It is only possible to insert MELODY Tracks. Tracks such as RHYTHM, CHORD and CONTROL cannot be inserted.
47	This procedure is not possible with a composer pattern or the metronome. Please select a preset rhythm pattern.
54	Please select a USER bank.
55	Special tracks such as CHORD (APC), RHY and CTL exist in the song from which you are copying and are incompatible with the destination song because it is in the GM mode.
56	AUTO PUNCH recording has been unsuccessful because **SEQUENCER** operation was interrupted before the PUNCH OUT measure was reached.

* This error message may also appear because of interference, such as static electricity.

No.	Contents
58	The song that you have tried to load exceeds this instrument's available memory and cannot be loaded. The selected song memory has been cleared. Please clear existing songs in the instrument's memory using SONG CLEAR to make more memory available, and try again.
62	The computer connection is not active because the computer port switch is set to MIDI. Please turn the power off, set the switch to the desired setting and turn the power back on.
64	Please select the Panel Memory that you want to name.
65	It is not possible to use the CHORD FINDER in this mode. Please select CHORD FINDER from HOME page or CHORD STEP RECORD page.
66	SOLO pads are special pads which include Chord information. Pleases use SOLO pads when the rhythm and accompaniment is playing.
67	There are no APC or CHORD tracks. Select and APC track or CHORD track, and try again.
68	It is not possible to record directly into the SOLO pads. Record on the SEQUENCER and Copy the melody and chord information into a SOLO pad.

ABOUT THE SELF-DIAGNOSTIC FUNCTION

This model has some self-diagnostic capabilities. There are two types of self-diagnostic functions: the "power on self-test" which runs a test when the power is turned on and notifies the user if an error is detected, and the "service mode" which is used when servicing the unit.

■ Power on self-test

This model runs the following self-diagnostic test when power is turned on. If an error is detected, a message is displayed on the LCD to notify the user.

Communication check between the Control Panel CPU (CPL P.C.B.: IC1/CPR P.C.B.: IC1) and the MAIN CPU (MAIN P.C.B.: IC6)

When power is turned on, the model checks communications between the MAIN CPU and each Control Panel CPU. If an error is detected, the following message is displayed on the LCD.

CAUTION!!

** ERROR in CPU data transmission **

Please try turning off and on again.
If this message appears again,
This unit needs repairing.

If this error occurs, perform the Control Panel CPU check from within the service mode. Using the self-diagnostic function, it is possible to determine which CPU (CPL/CPR P.C.B.) is suffering trouble.

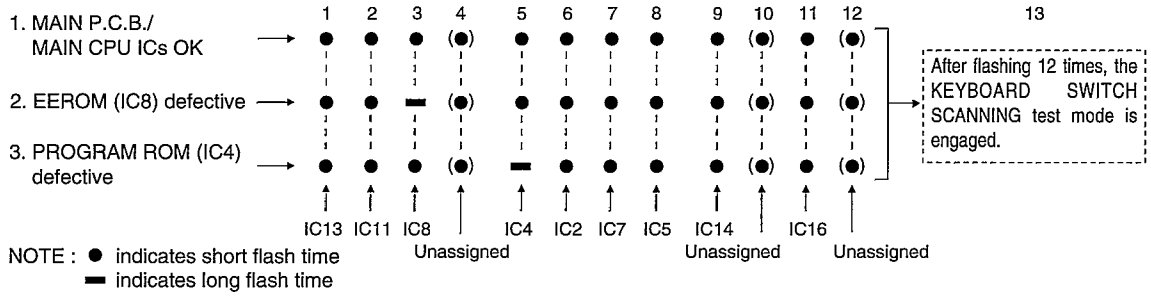
■ Service mode

The service mode makes it possible to determine whether the various test modes pass or fail.
The test modes in the following table are presented in an order based on circuit operation, but they are completely independent of one another. Select a mode as necessary, and run the test or check.

No.	Diagnostic Part/Diagnostic Device	Procedure of Service Mode
1	MAIN P.C.B.: MAIN CPU peripheral devices 1. DRAM (IC13) 2. DRAM (IC11) 3. EEROM (IC8) 4. Unassigned 5. PROGRAM ROM (IC4) 6. PROGRAM ROM (IC2) 7. TABLE DATA ROM (IC7) 8. TABLE DATA ROM (IC5) 9. RHYTHM DATA ROM (IC14) 10. Unassigned 11. LCD CONTROLLER (IC16) 12. Unassigned	1. Connect the CHECKING DEVICE to CN4 on the MAIN P.C.B. (refer to page I-20). 2. Turn on the power switch while holding down the CHECKING DEVICE switch.

When the power swich is turned on, the LED of the CHECKING DEVICE flashes 12 times . The order of the LED flashes corresponds to the IC number on the respective P.C.B.s as shown below. If an IC is defective, the corresponding flash time is longer.

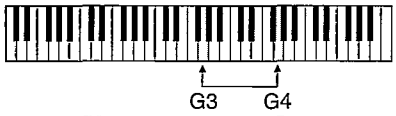
Examples

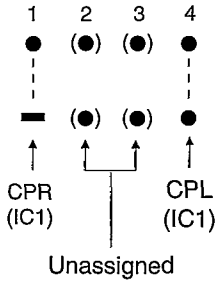
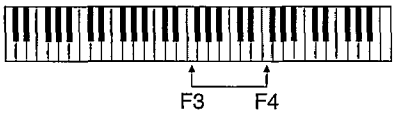

1. MAIN P.C.B./ MAIN CPU ICs OK
2. EEROM (IC8) defective
3. PROGRAM ROM (IC4) defective
1 2 3 4 5 6 7 8 9 10 11 12 13
IC13 IC11 IC8 IC4 IC2 IC7 IC5 IC14 IC16
Unassigned
Unassigned
Unassigned
After flashing 12 times, the KEYBOARD SWITCH SCANNING test mode is engaged.

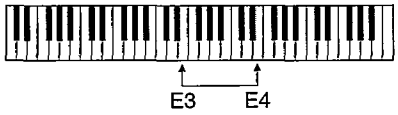
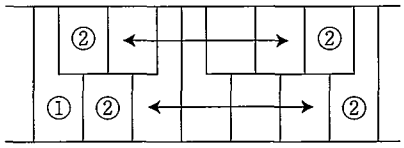
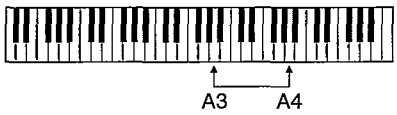
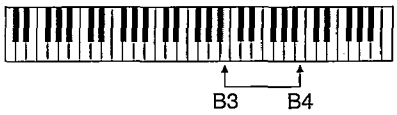
NOTE : ● indicates short flash time
▬ indicates long flash time

• KEYBOARD SWITCH SCANNING test

When the power switch is turned on, the LED of the CHECKING DEVICE flashes 12 times and then engages the KEYBOARD SWITCH SCANNING test mode (see the figure above).
Pressing any of the 88 keys will light the LED of the CHECKING DEVICE, while the LED will go out when the key is released. The KEYBOARD SWITCH SCANNING test determines whether the key switches and the Tone Generator LSI (MAIN P.C.B.: IC103) are working properly or not.

<table>
<tr><th>No.</th><th>Diagnostic Part/Diagnostic Device</th><th>Procedure of Service Mode</th></tr>
<tr><td>2</td><td>LCD test</td><td>Turn on the power switch while holding down the two G keys shown below.
 
</td></tr>
<tr><td></td><td colspan="2">While the message "LCD PANEL TEST" is displayed on the LCD, the entire screen is repeatedly switched in the order of white → black → "H" pattern.
* "H" pattern is a big "H". It is used to check for crosstalk.</td></tr>
<tr><td>3</td><td>CPR/CPL P.C.B.:
1 chip Microcomputer (IC1) check</td><td>1. In case the LCD is defective, connect the CHECKING DEVICE to CN4 on the MAIN P.C.B. (refer to page I-20).
2. Turn on the power switch while holding down the two D keys shown below and the CHECKING DEVICE switch if connected.

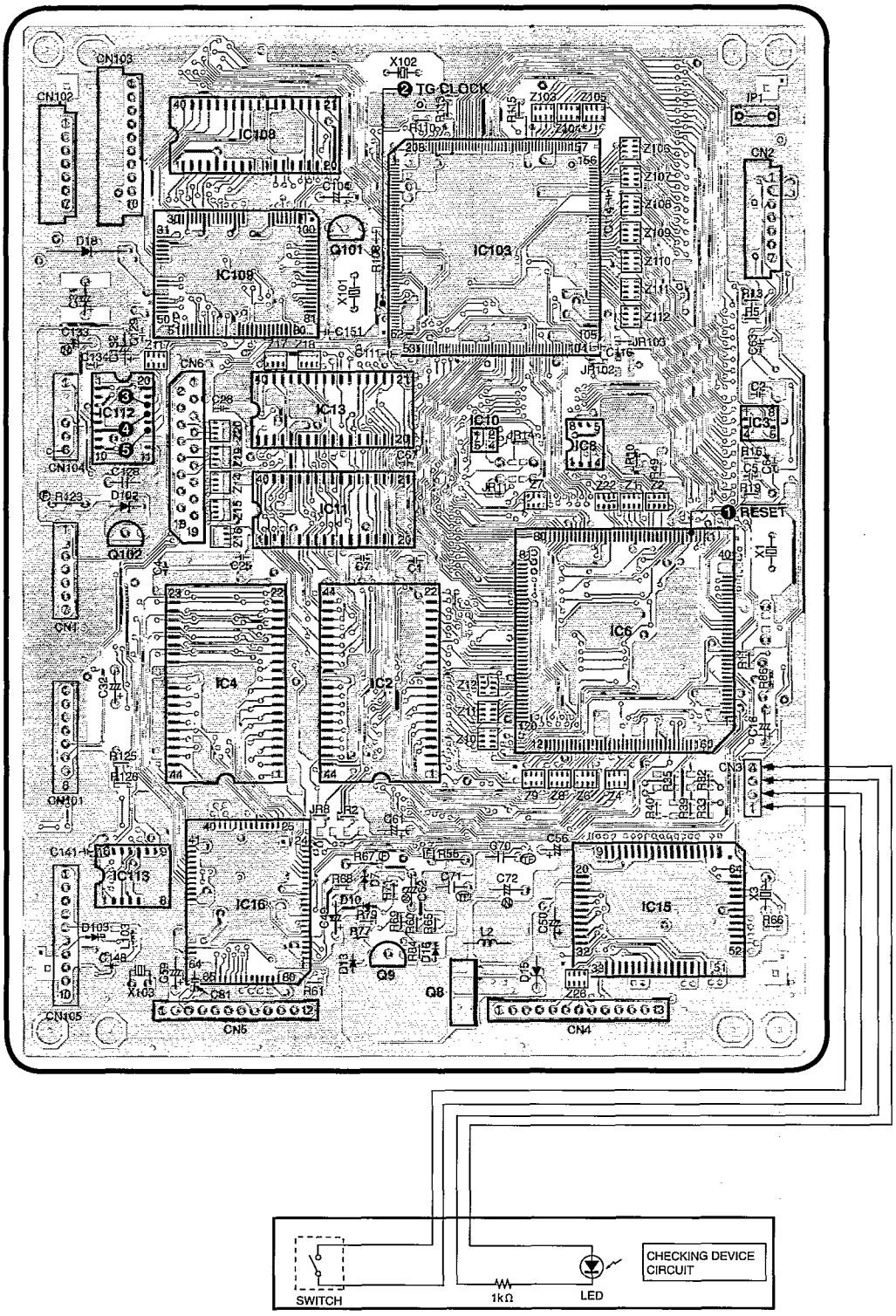
</td></tr>
<tr><td></td><td colspan="2">The results of the test will be displayed on the LCD with "PANEL CPU CHECKING" message.
In case the CHECKING DEVICE is connected, the LED of the CHECKING DEVICE flashes 4 times when the power swich is turned on. The order of the LED flashes corresponds to the Microcomputer (IC) number on the respective P.C.B.s as shown below. If an IC is defective, the corresponding flash time is longer.
Examples
1. CPR (IC1), CPL (IC1) OK
2. CPR (IC1) defective, CPL (IC1) OK
NOTE : ● indicates short flash time
▬ indicates long flash time
 
</td></tr>
<tr><td>4</td><td>CPR/CPL P.C.B.:
Control Panel switch and LED check</td><td>Turn on the power switch while holding down the two F keys shown below.
 
</td></tr>
<tr><td></td><td colspan="2">First, all of the LEDs on the Control Panel will light up simultaneously. Check that they do. Then, press the buttons on the Control Panel and confirm that the corresponding LED lights. For buttons without LEDs, the 4 BEAT display LEDs by the START/STOP button will light up simultaneously.
• To light up all of the LEDs on the Control Panel, press DEMO button.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Diagnostic Part/Diagnostic Device</th><th>Procedure of Service Mode</th></tr>
<tr><td>5</td><td>MAIN P.C.B.:
Wave ROM (IC104-107) check</td><td>Turn on the power switch while holding down the two E keys shown below.
 
</td></tr>
<tr><td></td><td>When set to the self-diagnostic mode, the Wave ROM output a sine wave. The Wave ROMs correspond to the keyboard keys as shown in the diagram to the right. When a key is pressed, the corresponding sine wave sound is produced. If no sound is produced, or if the sound is distored, the Wave ROM corresponding to the key is defective.
* A more detailed explanation as to setting conditions and other matters will be displayed on the LCD for your reference.</td><td>The key number indicates the Wave ROM number.
(①: IC104/105, ②: IC106/107)
 
</td></tr>
<tr><td>6</td><td>MAIN P.C.B.: Peripehral devices
1. FDC IC (IC15) test
2. DSP IC (IC109) test</td><td>Turn on the power switch while holding down the two A keys shown below.
 
</td></tr>
<tr><td></td><td colspan="2">1. The test results on the FDC IC will be displayed on the LCD.
NOTE: This test only checks communications between the FDC IC and MAIN CPU. It does not test operation of the FDC IC itself, the route from the FDC IC to Floppy Disk Drive operation.
To include the Floppy Disk Drive in testing, use the "Floppy Disk Drive SAVE/LOAD test" described below.
2. The correct sine wave sound will be produced if the DSP IC is working properly.
NOTE: Set the MAIN VOLUME to an appropriate level.
This test only checks the operation of the DSP IC itself. If the DSP IC operation is defective, check the relative DRAM (IC108) also.</td></tr>
<tr><td>7</td><td>Floppy Disk Drive:
SAVE/LOAD test</td><td>1.Insert the floppy disk formatted into the Disk Drive.
2.Turn on the power switch while holding down the two B keys shown below.
 
</td></tr>
<tr><td></td><td colspan="2">Pressing the button below the " ▶ " displayed on the LCD starts the Floppy Disk Drive SAVE/LOAD test. The test is carried out repeatedly.
Data is saved and loaded, and then the two data sets are compared. The number of times the test results "OK" or "NG" are counted and displayed on the LCD. To stop the test, press the button below the " ■ " displayed on the LCD.

Even when the Floppy Disk Drive is functioning properly, the test can result "NG". If this happens frequently, clean the magnetic heads of the Floppy Disk Drive with a cleaning disk. Then, change the disk used in testing with another disk and reperform the test. If the trouble is not solved, it is likely that the Disk Drive unit or some other part of the hardware is broken.</td></tr>
</table>

■ Connection between serving CHECKING DEVICE and MAIN P.C.B.

A MAIN P.C.B. (SIDE : A)



PRECAUTIONS BEFORE SERVICING THE MAIN CIRCUIT

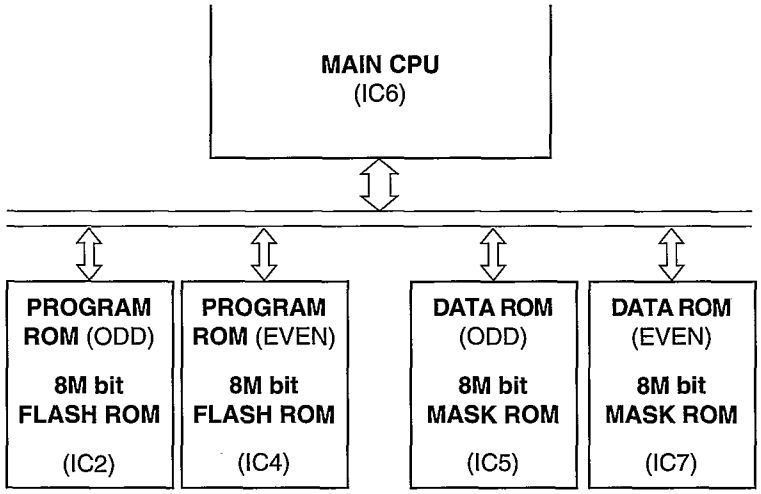
Note: In the initial production (over several months) of this model (Type A), FLASH ROMs (EEPROM) were used for the PROGRAM ROMs. In models produced thereafter (Type B), FLASH ROMs were not used. If changing any of these ICs, service the MAIN CIRCUIT as explained here following.

■ About the FLASH ROM

The FLASH ROM can be electrically erased and rewritten. This model is designed so that the repair technician can easily write and change programs and data in the FLASH ROM, by using a floppy disk.

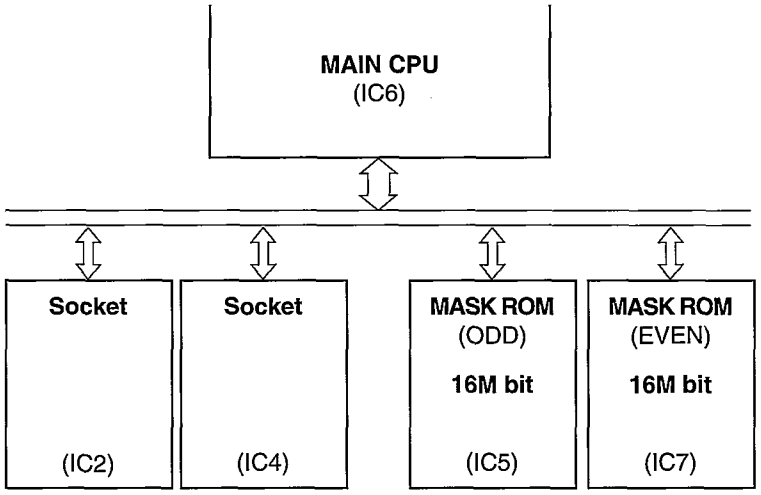
Block Diagram of MAIN CIRCUIT CPU and peripheral ICs

TYPE A



* FLASH ROM contents
IC2: MAIN CPU program (ODD)
IC4: MAIN CPU program (EVEN)

TYPE B



■ How to distinguish Type A from Type B

While pressing **PANEL MEMORY** buttons **1**, **2** and **3** at the same time, turn the power on. The model type can be determined from the resulting display.

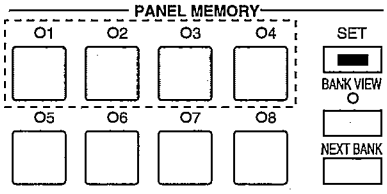
For Type A, "DEVICE=FLASH ROM" is shown on the display.
For Type B, "DEVICE=MASK ROM" is shown on the display.

■ Notes on replacing FLASH ROMs for Type A

The replacement parts include a FLASH ROM with a available memory and the "PROGRAM DISK" which contains the program to be written into the FLASH ROM. After replacing the FLASH ROM, always write the program into it from the floppy disk included in the replacement parts. For details on programming, see "How to write the program/data to the FLASH ROMs for Type A (or for Type B in which the FLASH ROMs has been installed in the sockets" below.

■ How to write the program/data to the FLASH ROMs for Type A (or for Type B in which the FLASH ROMs has been installed in the sockets)

① Load the "PROGRAM DISK" included in the replacement parts into the Floppy Disk Drive.
② Hold down the **PANEL MEMORY** buttons **1**, **2**, **3** and **4**, and turn on the power switch.
③ Check "Flash Memory Update" is displayed on the LCD. Only then, release the **PANEL MEMORY** buttons. The program will be written into the FLASH ROM automatically.



④ When the operation is complete, "Completed!!" will be displayed on the LCD. Turn the power switch off and then back on again. Check the instrument is functioning properly.

■ How to write the program for Type B

Follow the steps below to write the program for Type B model in which the FLASH ROMs have not been installed.
① Install the FLASH ROMs in the unused sockets.
② Change the jumper wire settings as follows:
Discontinued: JP5, JP8, JP10
Added: JP6, JP7, JP9
③ Write the program/data in the same manner as for Type A, above.

MIDI IMPLEMENTATION CHART

Keyboard [SX-KN1600] **(Transmitted)**

Function		RIGHT1,2,LEFT, PART4~15	PART16	ACMP1	ACMP2,3	BASS	DRUMS	CHORD	CONTROL	Remarks
Basic	Default	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	memorized
Channel	Changed	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	
	Default	3	3	3	3	3	3	3	3	OMNI OFF,POLY MODE
Mode	Messages	×	×	×	×	×	×	×	×	
	Altered	–	–	–	–	–	–	–	–	
Note		0-119	0-127	0-119	0-119	0-119	0-127	0-119	–	Changes depending on the position of the transpose control,octave shift,and drums type.
Number	True voice	–	–	–	–	–	–	–	–	
Velocity	Note ON	○	○	○	○	○	○	○	–	
	Note OFF	×	×	×	×	×	×	×	–	
After	Key's	×	×	×	×	×	×	×	–	
Touch	Ch's	○×*	×	×	×	×	×	×	–	
Pitch Bend		○×*	×	○×*	○×*	○×*	×	○×*	×	
Control Change	0,32	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	bank select MSB, LSB
	1	○×*	×	○×*	○×*	○×*	×	○×*	×	modulation
	6,38	○×*	×	×	×	×	×	×	×	data entry MSB, LSB
	7	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	volume
	10	○×*	×	○×*	○×*	○×*	×	×	×	panpot
	11	○×*	○×*	○×*	○×*	○×*	×	×	○×*	expression
	64	○×*	×	○×*	○×*	○×*	×	○×*	×	sustain
	80	×	×	○×*	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	○×*	×	×	intro, fill in, ending
	83	×	×	×	×	×	×	×	○×*	fade in/out
	91	○×*	○×*	○×*	○×*	○×*	○×*	○×*	○×*	reverb
	92	○×*	○×*	×	×	×	×	×	×	DSP effect 2
	93	○×*	○×*	×	×	×	×	×	○×*	DSP effect 1
	94	○×*	×	○×*	○×*	○×*	×	○×*	×	digital effect
	95	×	×	×	×	×	×	×	○	acoustic illusion
	100,101	○×*	×	×	×	×	×	×	×	RPN LSB, MSB
	120	○	○	×	×	×	×	×	×	all sound off
	121	○×*	○×*	×	×	×	×	×	×	reset all cotrollers
Prog Change		○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	Changes depending on program change mode and prog.cng to p.mem.
	True #	–	–	–	–	–	–	–	–	
System exclusive		○								
System common	Song Pos	○×*								
	Song Sel	○×* (0-19)								
	Tune	×								
System Real Time	Clock	○								
	Commands	○×*								start/stop,continue
Aux Messages	Local ON/ OFF	×	×	×	×	×	×	×	–	
	All notes OFF	×	×	×	×	×	×	×	–	
	Active Sense	○								
	Reset	×								
Notes		○×*.....Whether or not the data for each of these items is transmitted can be set.								

Mode 1: OMINI ON, POLY Mode 2: OMNI ON, MONO ○:Yes
Mode 3: OMINI OFF, POLY Mode 4: OMNI OFF, MONO ×:No

Keyboard [SX-KN1600] **(Recognized)**

Function		RIGHT1,2,LEFT, PART4~15	PART16	ACMP1	ACMP2,3	BASS	DRUMS	CHORD	CONTROL	Remarks
Basic Channel	Default	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	memorized
	Changed	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF,POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	–	–	–	–	–	–	–	–	
Note Number		0-127	0-127	0-127	0-127	0-127	0-127	0-127	–	Changes depending on the position of the transpose control,octave shift, and drums type.
	True voice	0-127	0-127	0-127	0-127	0-127	0-127	0-127	–	
Velocity	Note ON	○	○	○	○	○	○	○	–	
	Note OFF	×	×	×	×	×	×	×	–	
After Touch	Key's	×	×	×	×	×	×	×	–	
	Ch's	○×*	×	×	×	×	×	×	–	
Pitch Bend		○×*	×	○×*	○×*	○×*	×	○×*	×	
Control Change	0,32	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	bank select MSB, LSB
	1	○×*	×	○×*	○×*	○×*	×	○×*	×	modulation
	6,38	○×*	×	×	×	×	×	×	×	data entry MSB, LSB
	7	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	volume
	10	○×*	×	○×*	○×*	○×*	×	×	×	panpot
	11	○×*	○×*	○×*	○×*	○×*	×	×	○×*	expression
	64	○×*	×	○×*	○×*	○×*	×	○×*	×	sustain
	80	×	×	○×*	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	○×*	×	×	intro, fill in, ending
	83	×	×	×	×	×	×	×	○×*	fade in/out
	91	○×*	○×*	○×*	○×*	○×*	○×*	○×*	○×*	reverb
	92	○×*	○×*	×	×	×	×	×	×	DSP effect 2
	93	○×*	○×*	×	×	×	×	×	○×*	DSP effect 1
	94	○×*	×	○×*	○×*	○×*	×	○×*	×	digital effect
	95	×	×	×	×	×	×	×	○	acoustic illusion
	100,101	○×*	×	×	×	×	×	×	×	RPN LSB, MSB
	120	○	○	○	○	○	○	○	×	all sound off
	121	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	reset all cotrollers
Prog Change		○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	Changes depending on program change mode and prog.cng to p.mem.
	True #	0-127	0-127	0-127	0-127	0-127	0-127	0-127	–	
System exclusive		○								
System common	Song Pos	○×*								
	Song Sel	○×* (0-19)								
	Tune	×								
System Real Time	Clock	○								
	Commands	○×*								start/stop,continue
Aux Messages	Local ON/ OFF	×	×	×	×	×	×	×	–	
	All notes OFF	○	○	○	○	○	○	○	–	
	Active Sense	○								
	Reset	×								
Notes		○×*·····Whether or not the data for each of these items is received can be set.								

Mode 1: OMINI ON, POLY Mode 2: OMNI ON, MONO ○:Yes
Mode 3: OMINI OFF, POLY Mode 4: OMNI OFF, MONO ×:No

PRECAUTIONS BEFORE SERVICING

■ Precautions for measuring of the output waveforms.

1. The waveform was measured with a "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of musical tone signals shown may differ somewhat due to the difference in the timing of triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform illustration is 1/10 of the actual value (e.g. 0.2 V/cm should be 2.0 V/cm).
3. To measure the waveforms, first set this unit to the self-diagnostic mode (refer to page I-19, No. 5). The Wave ROM output will then be output as a sine wave to facilitate the servicing check.

■ Important safety notice:

Components identified by a ⚠ mark have special characteristics impotant for safety.
When replacing any of these components, use only manufacture's specified parts.

■ Symbolic Marks

The symbolic marks for resistors and capacitors which used in this circuits are classified as following TABLE-1 and TABLE-2.

1. RESISTORS
   - Resistors without symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
   - All resistors are 1/4 WATT, ±5 % TOLERANCE unless otherwise designated in schematic diagrams.

(TABLE-1)

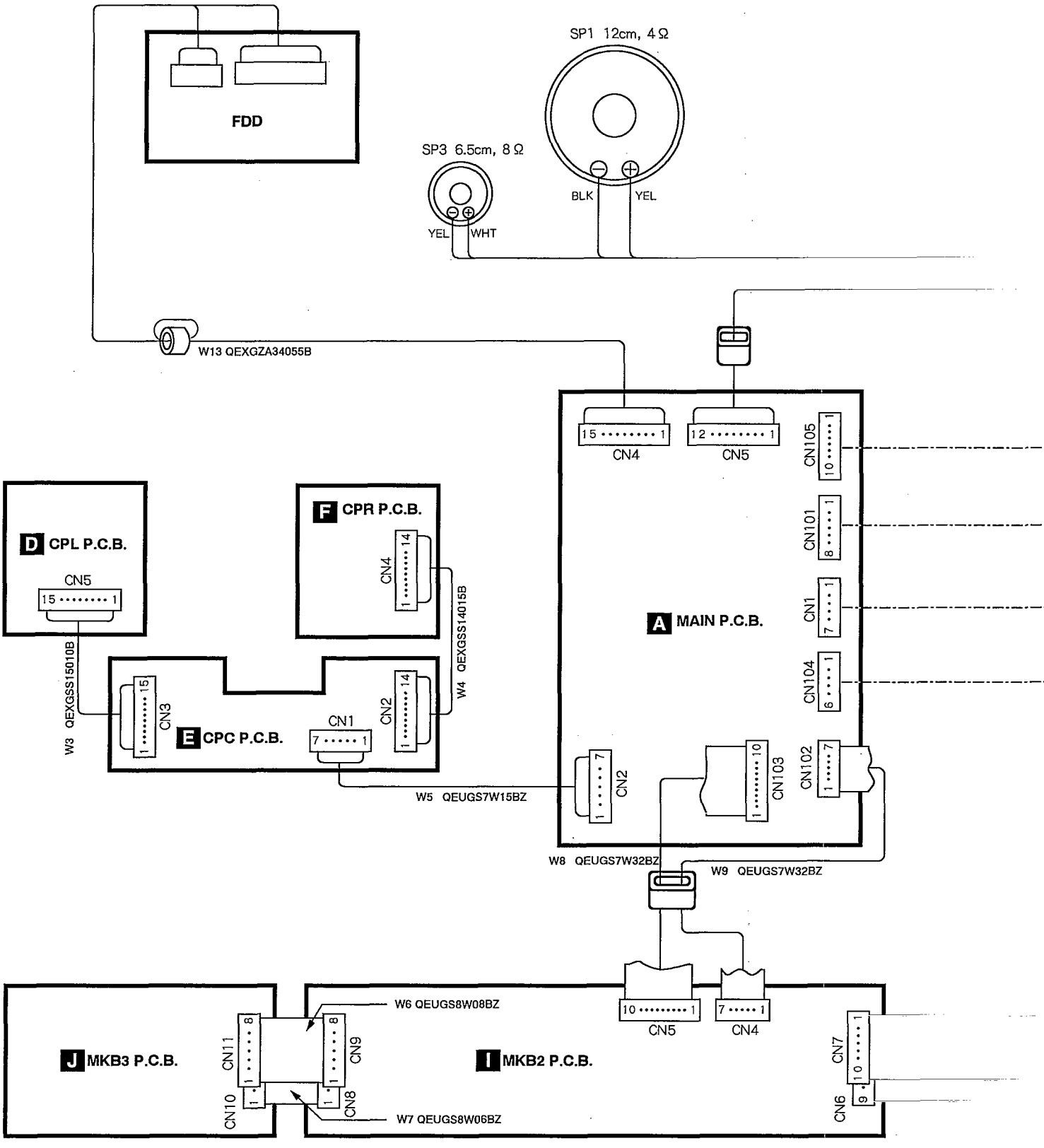
SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
Ⓕ	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD—F—type)	Ⓕ	Fixed Metal Film Resistors "FLAME-PROOF" (ERX—type)
Ⓕ	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF—type)	[F]	Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ—type)
Ⓕ	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG—type)	[F]	Fuse Type Fixed Carbon File Resistors "FLAME-PROOF" (ERD2FC—type)
Ⓖ	Fixed Metal Film Resistors (Precision and High Stability) (ERO—type)		

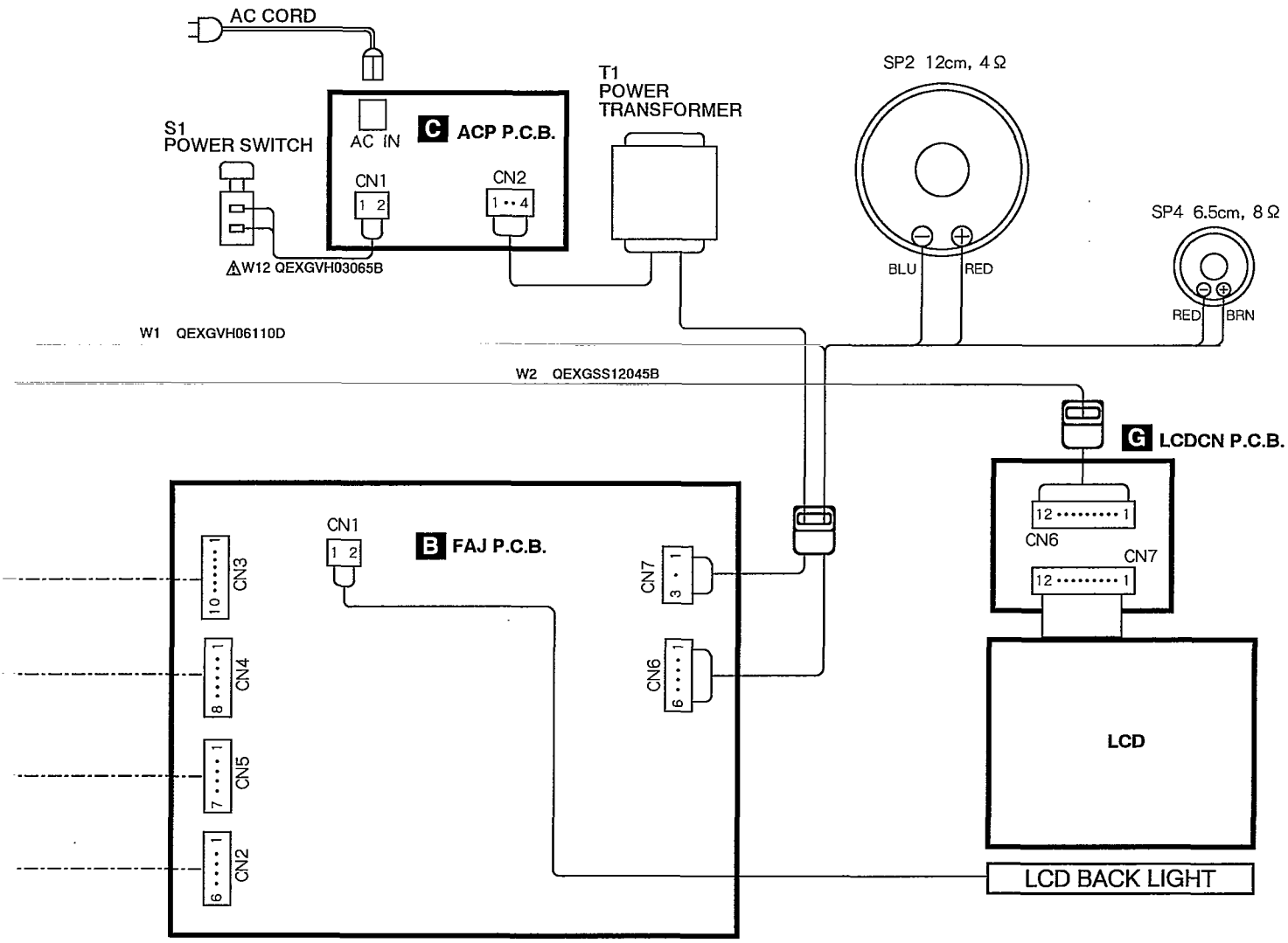
2. CAPACITORS
   - Capacitors without symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ±10 % Tolerance)
   - Polarized capacitors without symbolic mark are Aluminum Electrolytic Capapcitors. (ECEA-type, ±20 % Tolerance)

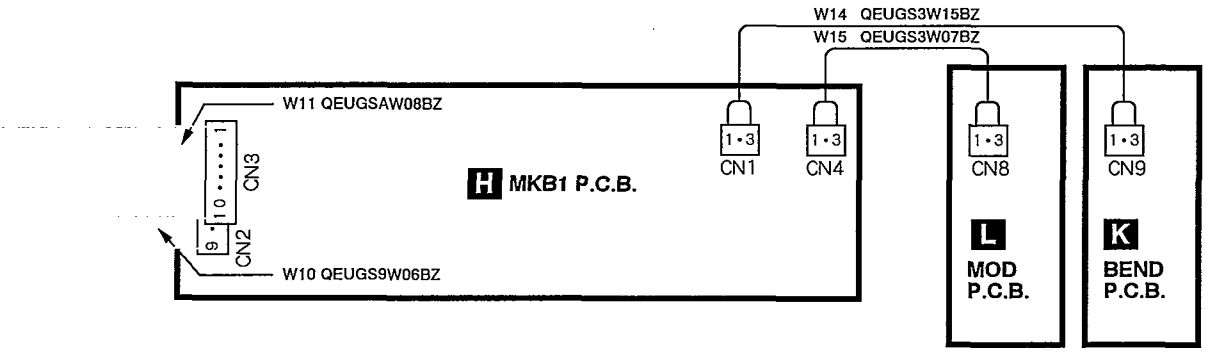
(TABLE-2)

SYMBOL	SPECIFICATION	TYPE
Ⓝ	Non-Polarized Electrolytic Capacitors	ECEA_KN_type
Ⓨ	Non-Polarized Electrolytic (for Network system)	ECEA_Y_type
Ⓣ	Tantalum Solid Electrolytic Capacitors	ECS_type
ⓉⒻ	Metalized Plastic Film Capacitors (TF Series)	ECQV_type
○	Temperature Compensating Ceramic Capacitors	ECC_type
	High-Dielectric Constant Ceramic Capacitors	ECK_type ECR_type
	Axial Lead Ceramic Capacitors	ECB_type
	Metalized Polyester Film Capacitors for Across the Line	ECQ_EW_type
	Aluminum Electrolytic Capacitors for Smoothing Circuit	ECES_type
	Multilayer Ceramic Chip Capacitors	ECUV_type

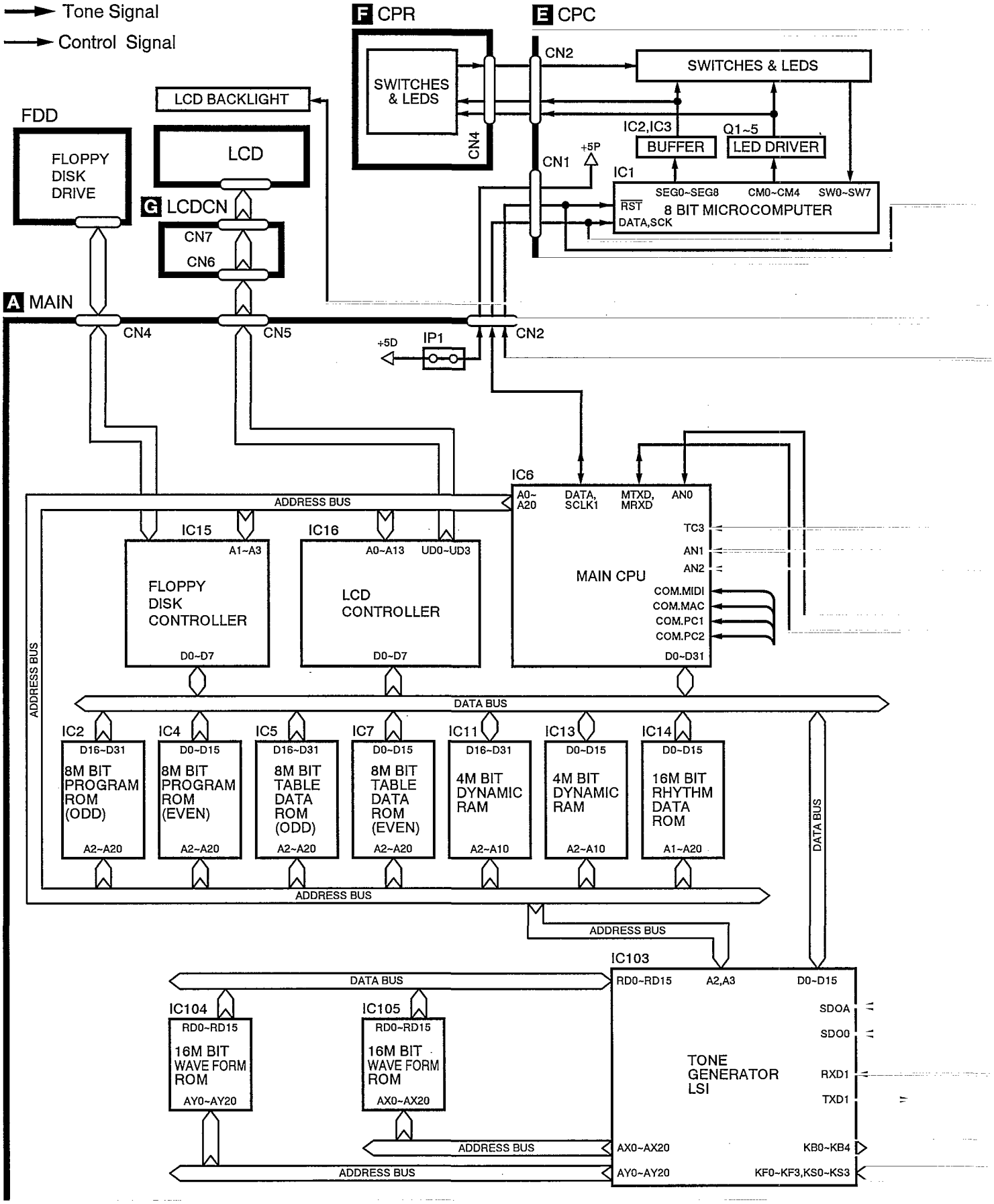
■WIRING CONNECTION Diagram

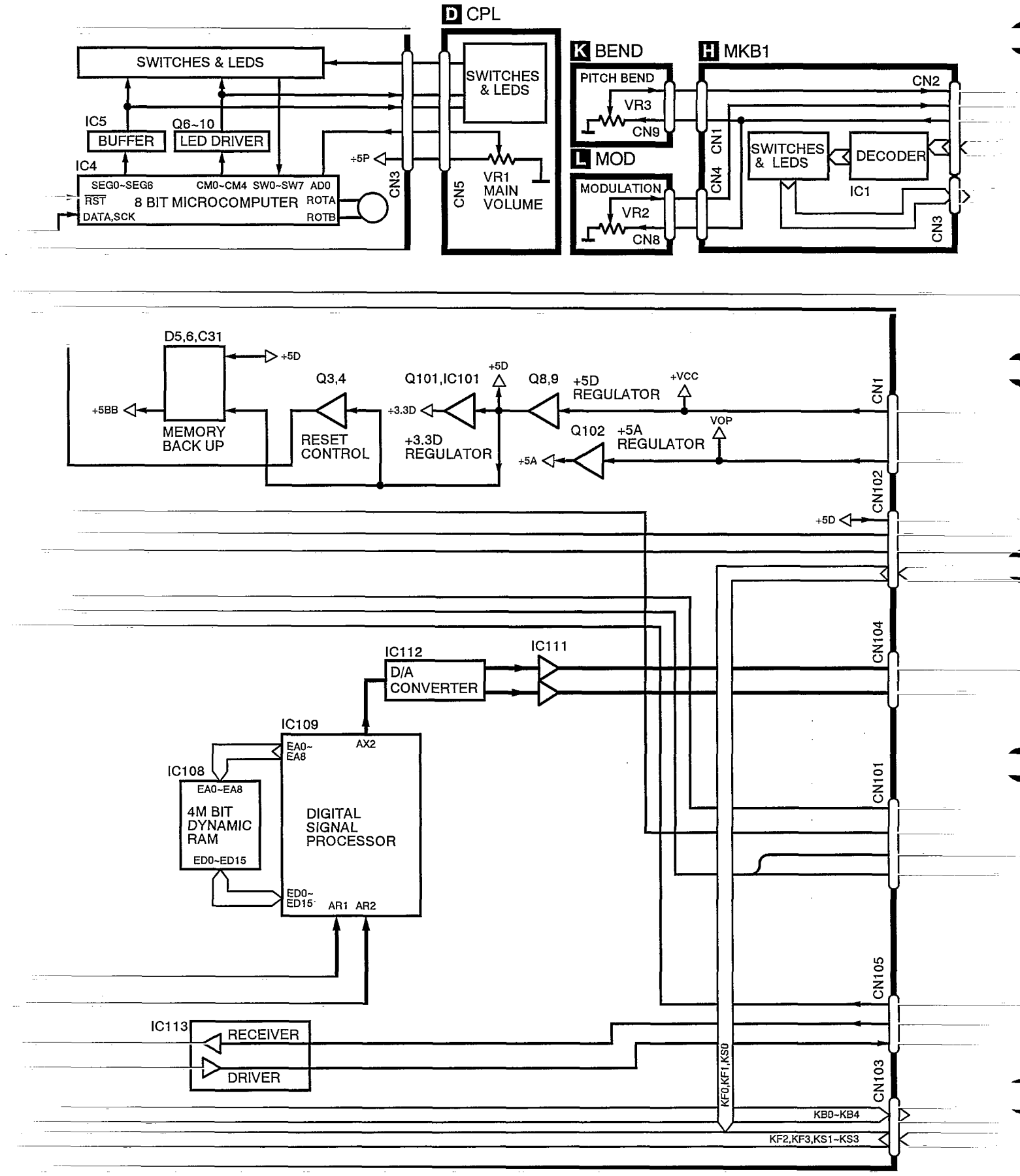


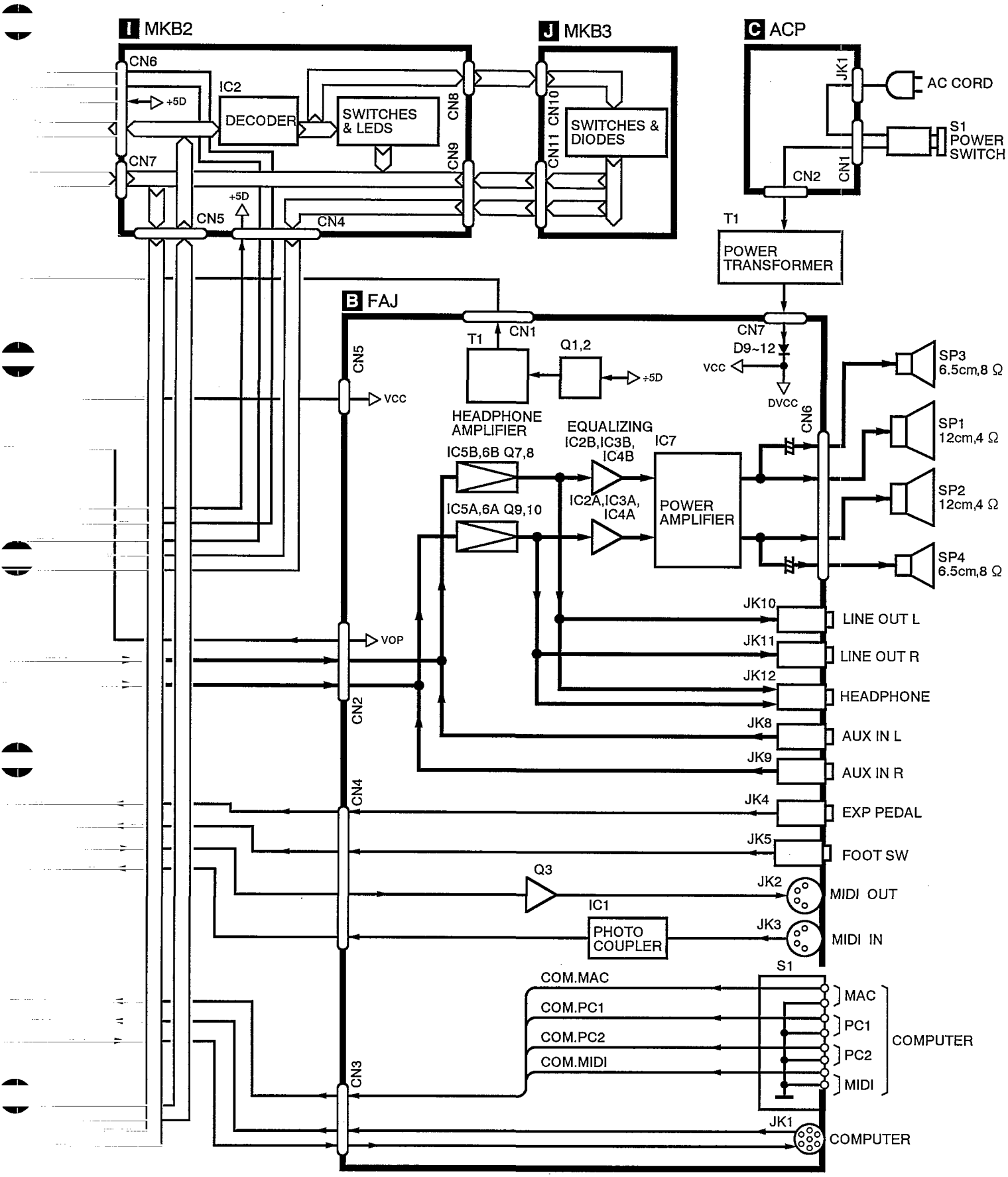

AC CORD
S1
POWER SWITCH
AC IN
C ACP P.C.B.
CN1
CN2
T1
POWER
TRANSFORMER
SP2 12cm, 4Ω
SP4 6.5cm, 8Ω
BLU
RED
RED
BRN
⚠W12 QEXGVH03065B
W1 QEXGVH06110D
W2 QEXGSS12045B
G LCDCN P.C.B.
CN6
CN7
B FAJ P.C.B.
CN3
CN4
CN5
CN2
CN1
CN7
CN6
LCD
LCD BACK LIGHT


W14 QEUGS3W15BZ
W15 QEUGS3W07BZ
W11 QEUGSAW08BZ
H MKB1 P.C.B.
CN3
CN2
CN1
CN4
CN8
CN9
L
MOD
P.C.B.
K
BEND
P.C.B.
W10 QEUGS9W06BZ

■BLOCK Diagram

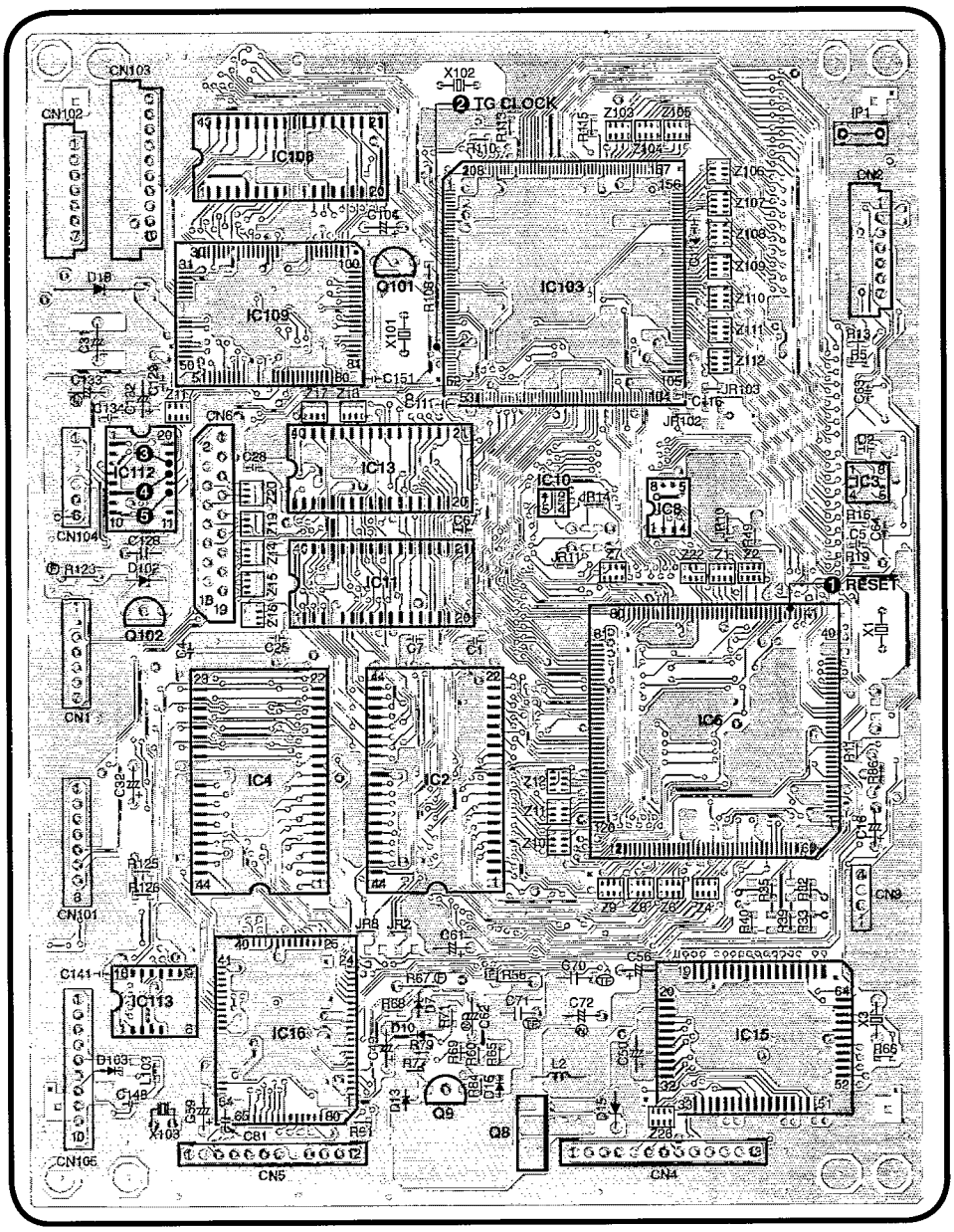



D CPL
SWITCHES & LEDS
IC5
BUFFER
Q6~10
LED DRIVER
IC4
SEG0~SEG6
CM0~CM4 SW0~SW7 AD0
RST
8 BIT MICROCOMPUTER
ROTA
DATA,SCK
ROTB
+5P
CN3
CN5
SWITCHES & LEDS
VR1
MAIN
VOLUME
K BEND
PITCH BEND
VR3
CN9
L MOD
MODULATION
VR2
CN8
H MKB1
CN2
CN1
CN4
SWITCHES & LEDS
DECODER
IC1
CN3
D5,6,C31
+5D
+5BB
MEMORY
BACK UP
Q3,4
RESET
CONTROL
Q101,IC101
+3.3D
+3.3D
REGULATOR
Q8,9
+5D
REGULATOR
+VCC
Q102
+5A
+5A
REGULATOR
VOP
CN1
CN102
+5D
IC112
D/A
CONVERTER
IC111
CN104
IC109
EA0~
EA8
AX2
IC108
EA0~EA8
4M BIT
DYNAMIC
RAM
ED0~ED15
DIGITAL
SIGNAL
PROCESSOR
ED0~
ED15
AR1 AR2
CN101
CN105
IC113
RECEIVER
DRIVER
KF0,KF1,KS0
CN103
KB0~KB4
KF2,KF3,KS1~KS3

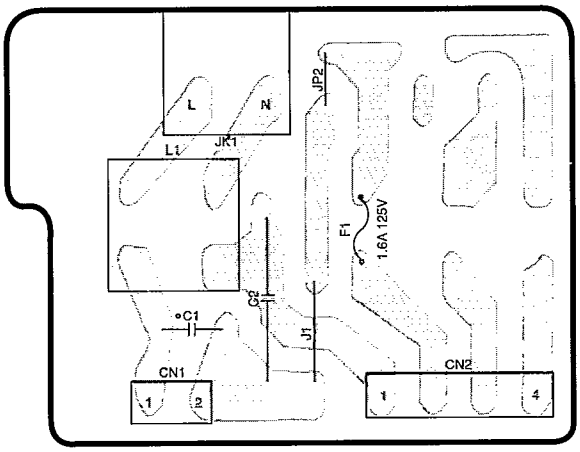

I MKB2
CN6
+5D
IC2
DECODER
SWITCHES & LEDS
CN8
CN9
CN7
+5D
CN5
CN4
J MKB3
CN11 CN10
SWITCHES & DIODES
C ACP
JK1
AC CORD
S1
POWER SWITCH
CN1
CN2
T1
POWER TRANSFORMER
B FAJ
CN1
T1
Q1,2
+5D
CN7
D9~12
VCC
DVCC
CN5
VCC
HEADPHONE AMPLIFIER
EQUALIZING
IC2B,IC3B, IC4B
IC7
IC5B,6B Q7,8
IC2A,IC3A, IC4A
IC5A,6A Q9,10
POWER AMPLIFIER
CN6
SP3 6.5cm,8 Ω
SP1 12cm,4 Ω
SP2 12cm,4 Ω
SP4 6.5cm,8 Ω
VOP
JK10
LINE OUT L
JK11
LINE OUT R
JK12
HEADPHONE
CN2
JK8
AUX IN L
JK9
AUX IN R
CN4
JK4
EXP PEDAL
JK5
FOOT SW
Q3
JK2
MIDI OUT
IC1
PHOTO COUPLER
JK3
MIDI IN
S1
COM.MAC
COM.PC1
COM.PC2
COM.MIDI
MAC
PC1
PC2
MIDI
COMPUTER
CN3
JK1
COMPUTER

■Printed Circuit Board and Schematic Diagram

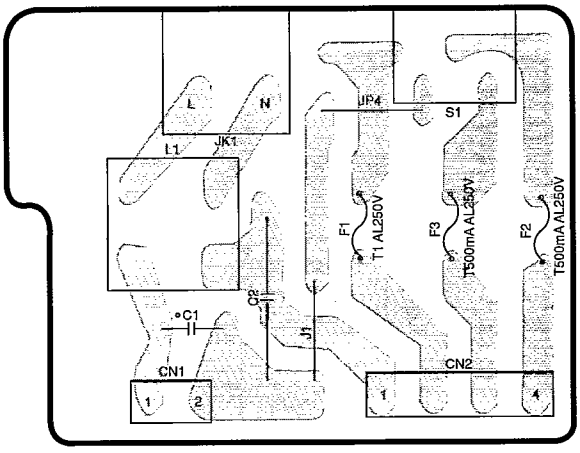
A MAIN P.C.B. (SIDE : A)



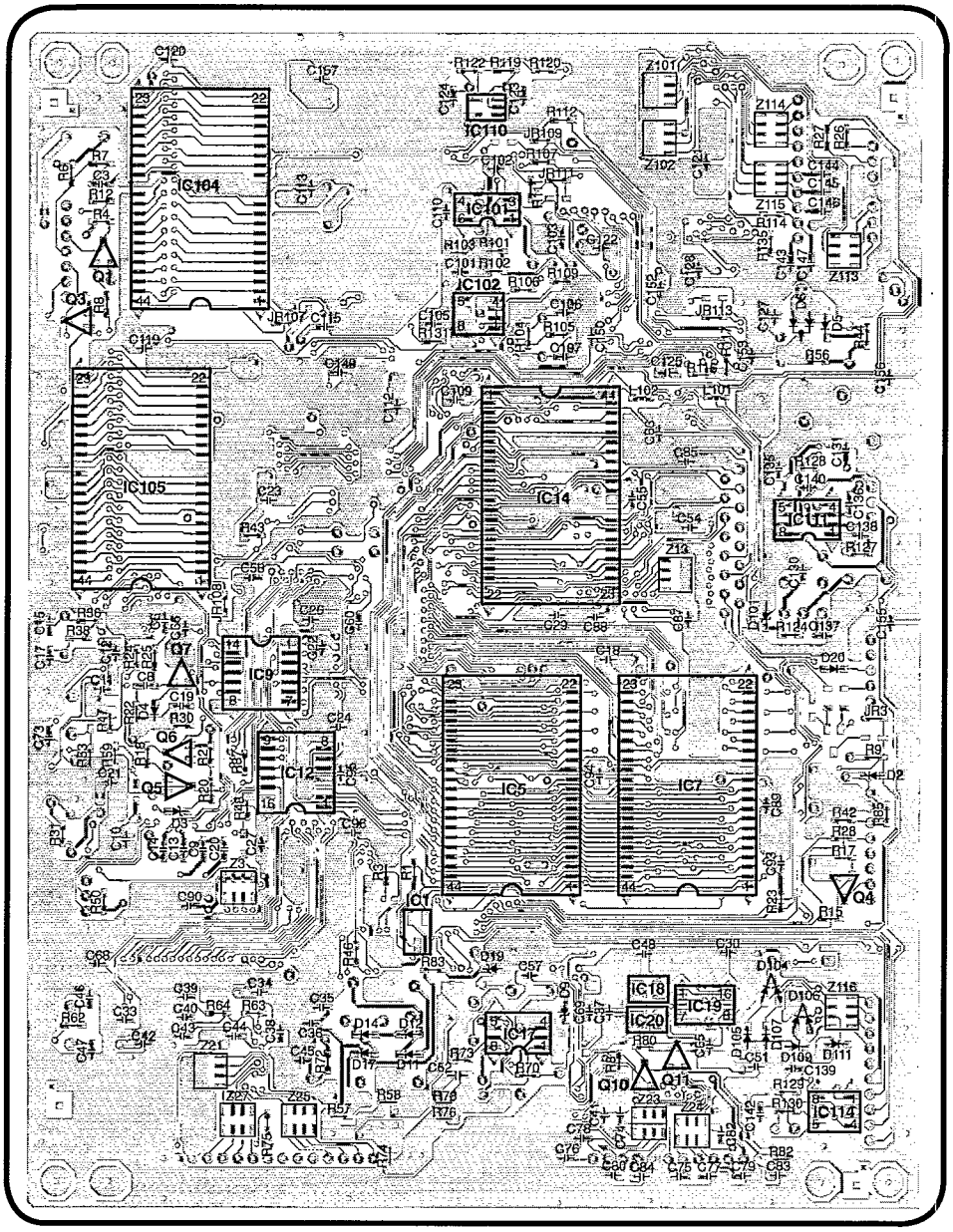
C ACP P.C.B. (M,MC,XM)



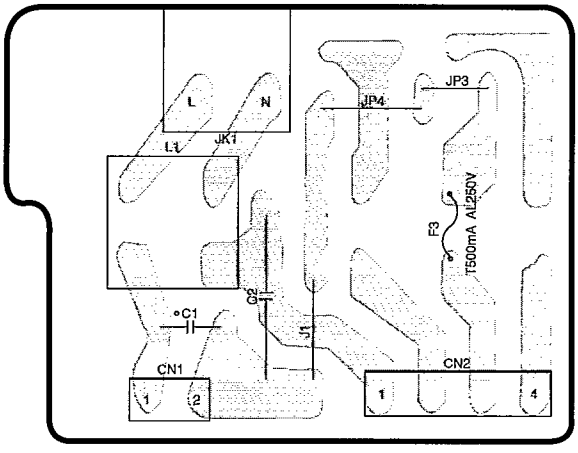
C ACP P.C.B. (X,XS,XD,XT)



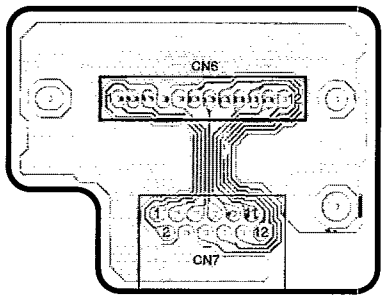
A MAIN P.C.B. (SIDE : B)



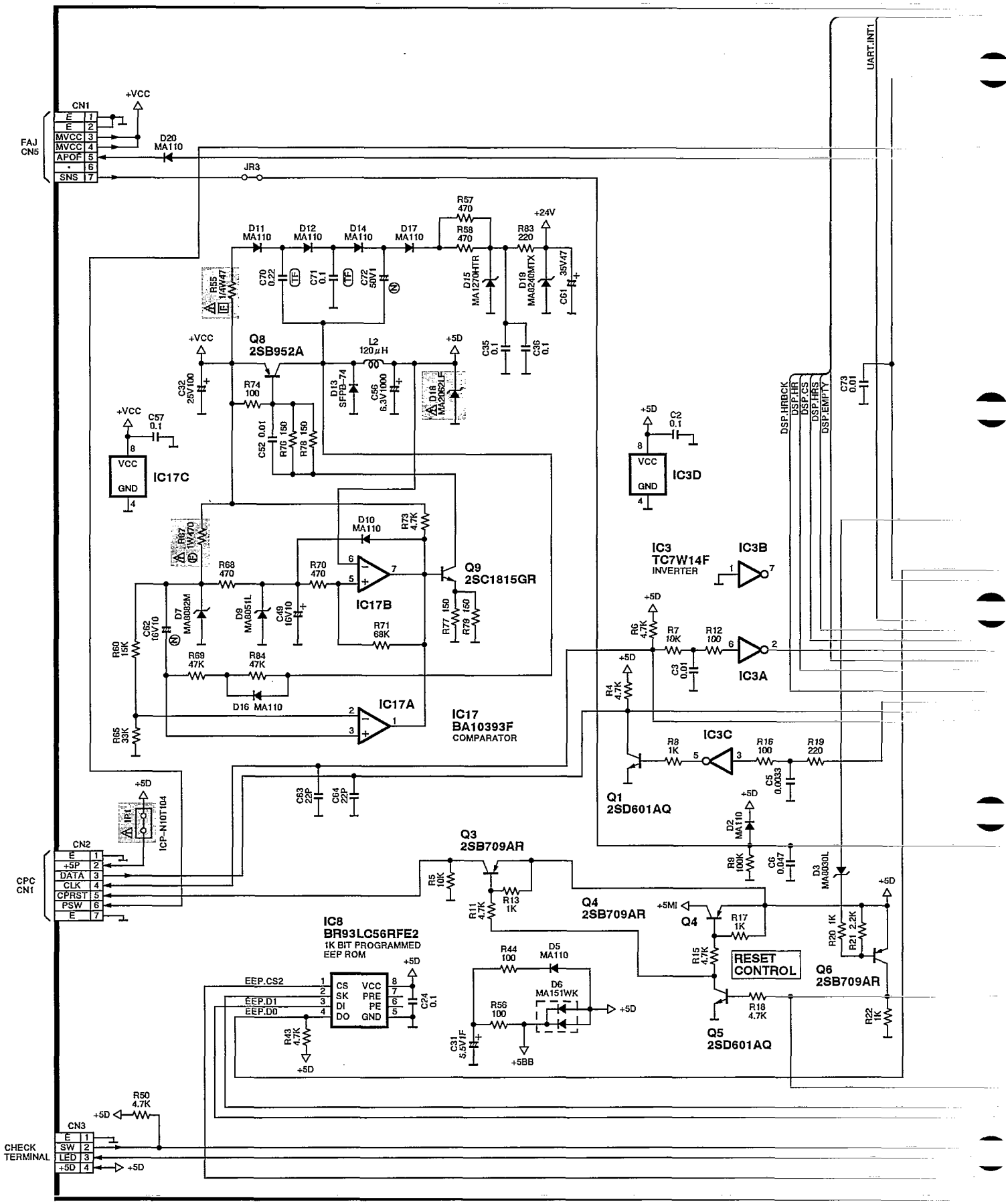
C ACP P.C.B. (OTHER)

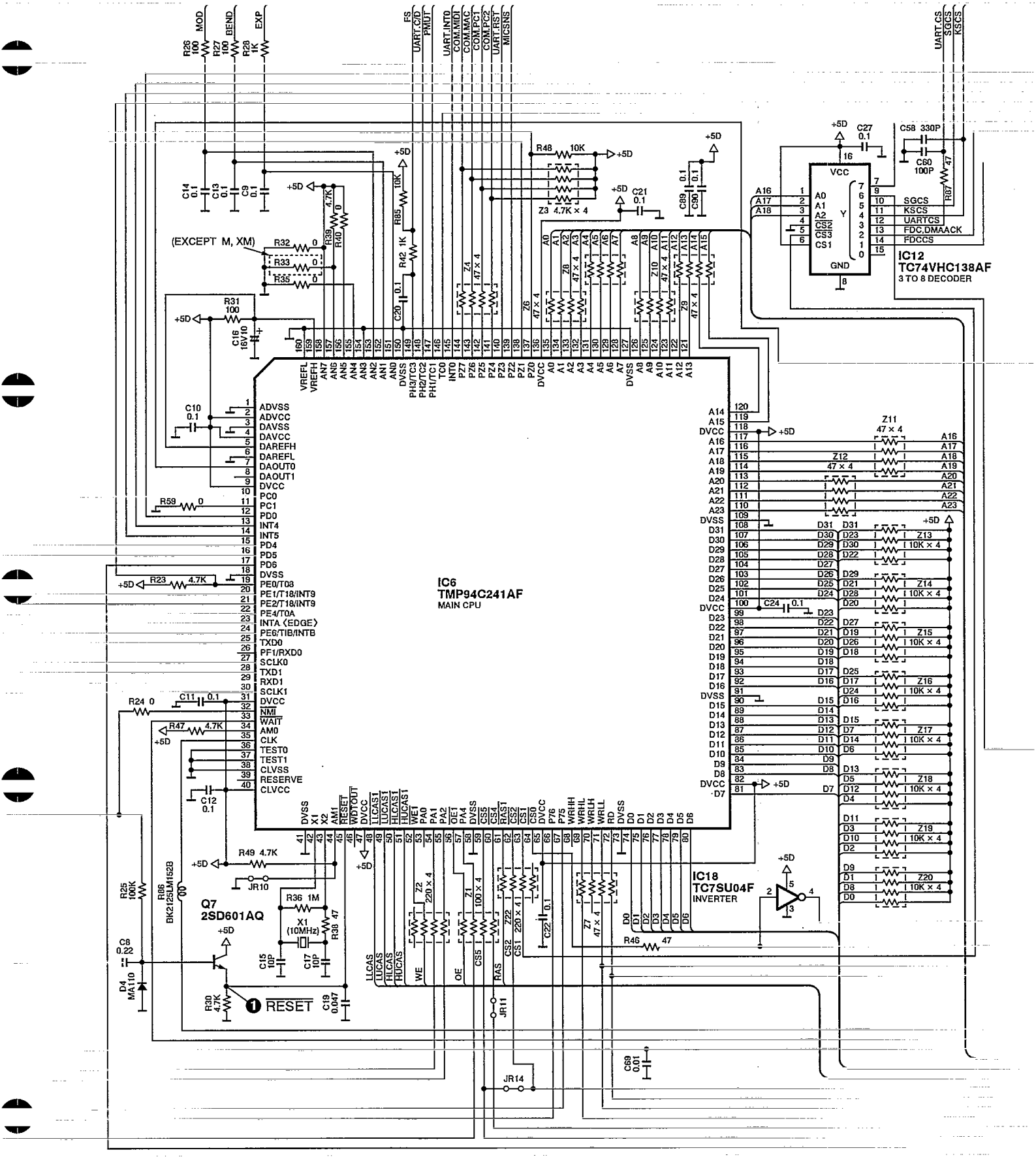


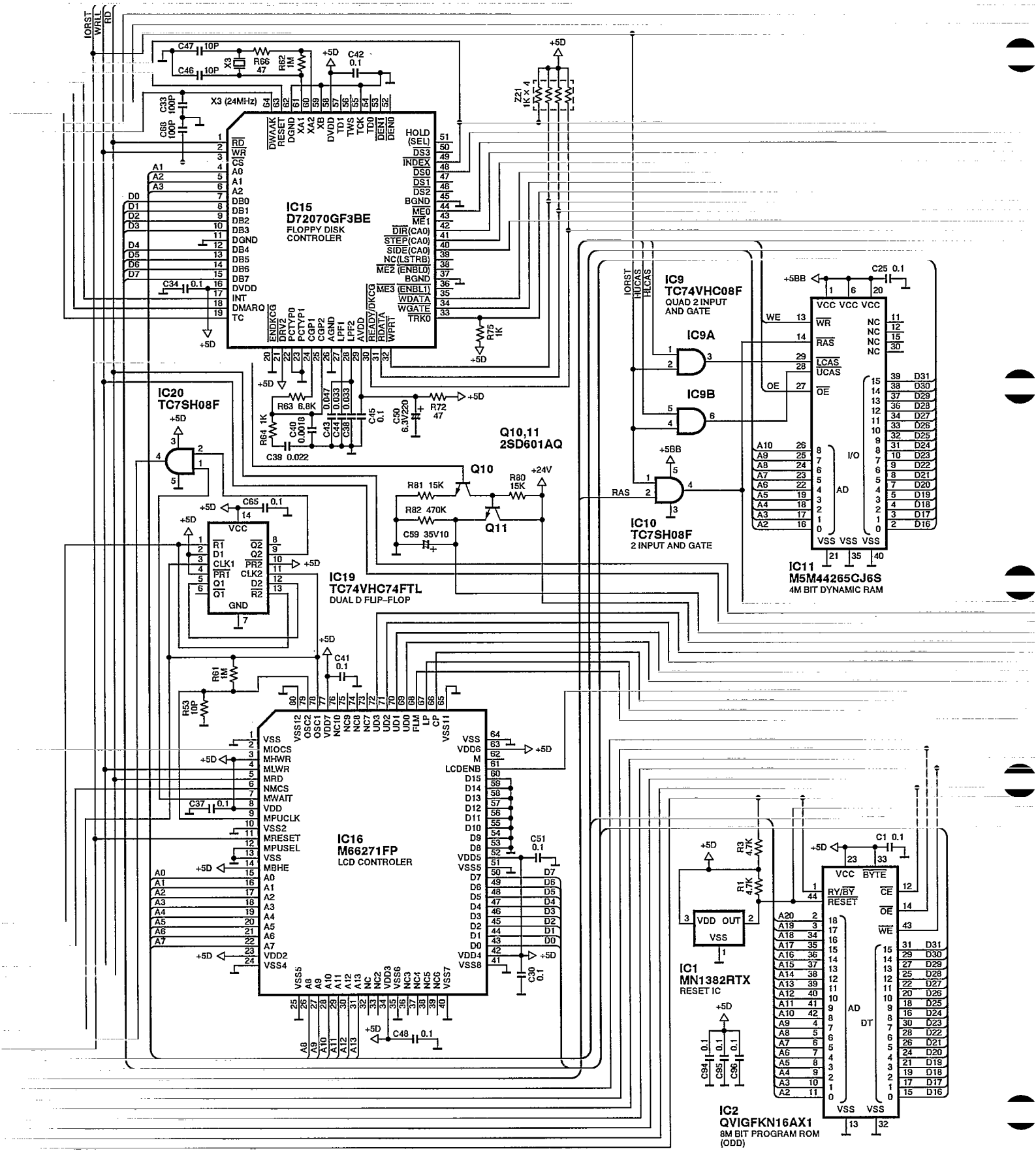
G LCDCN P.C.B.

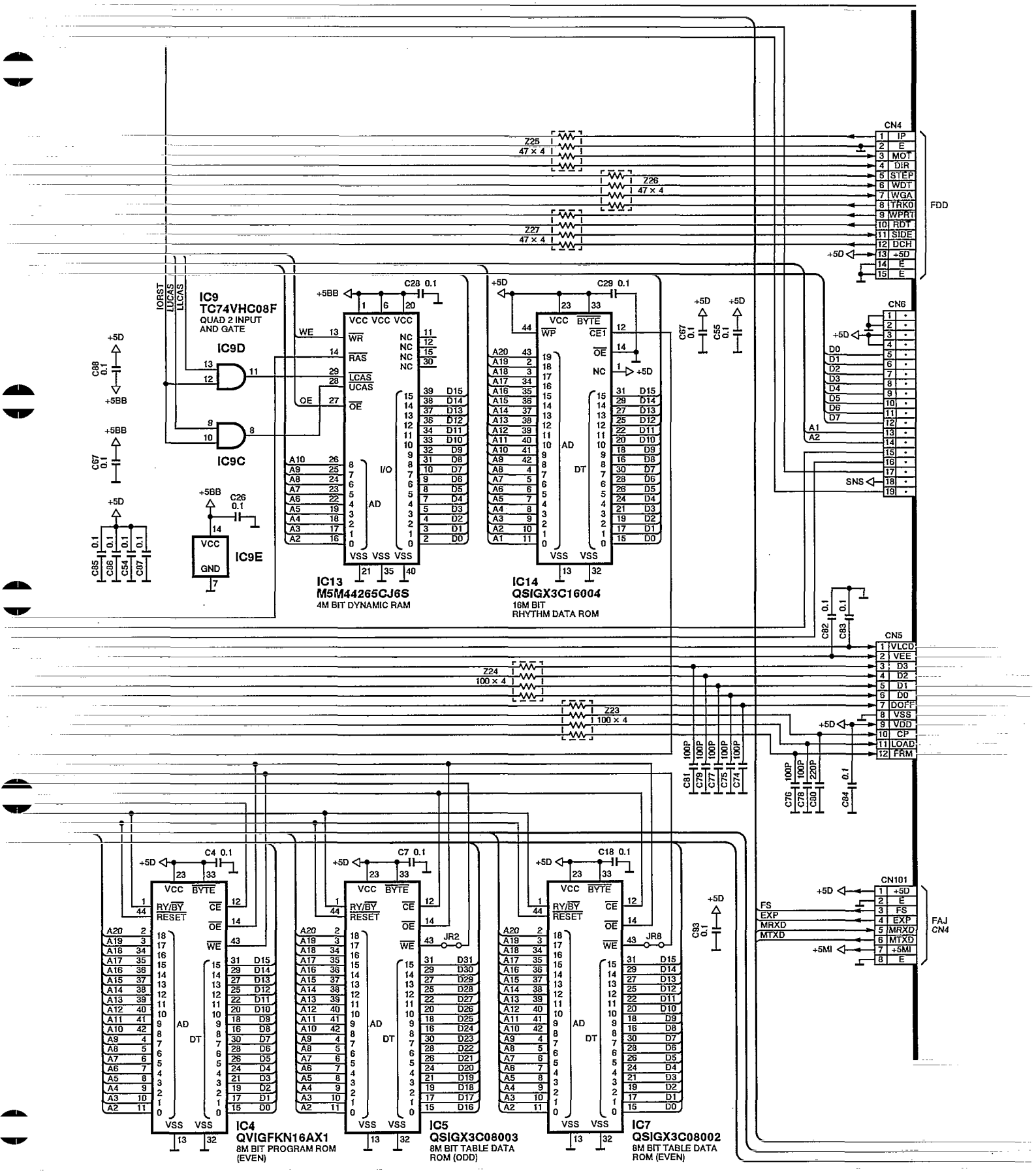


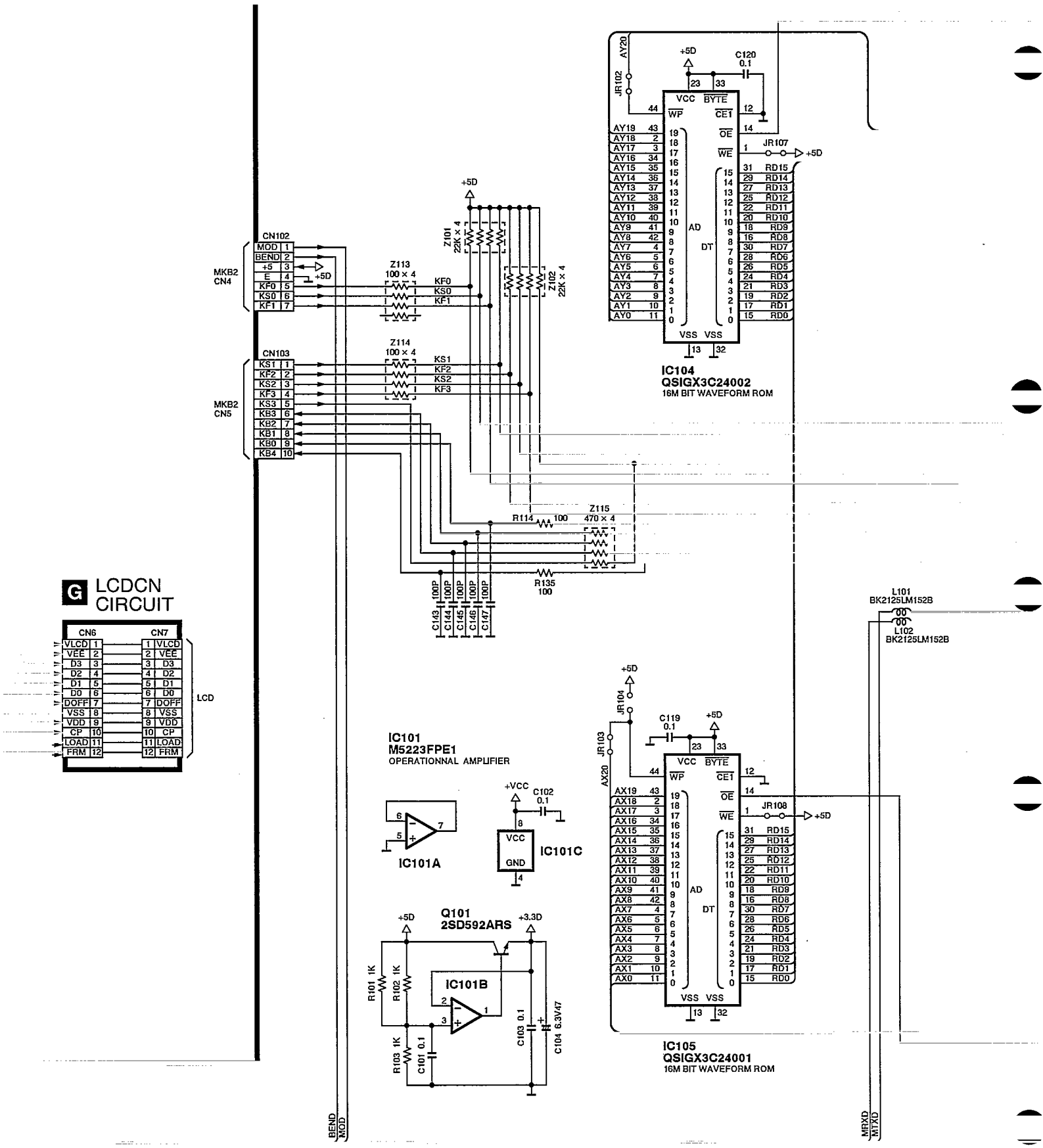
A MAIN CIRCUIT

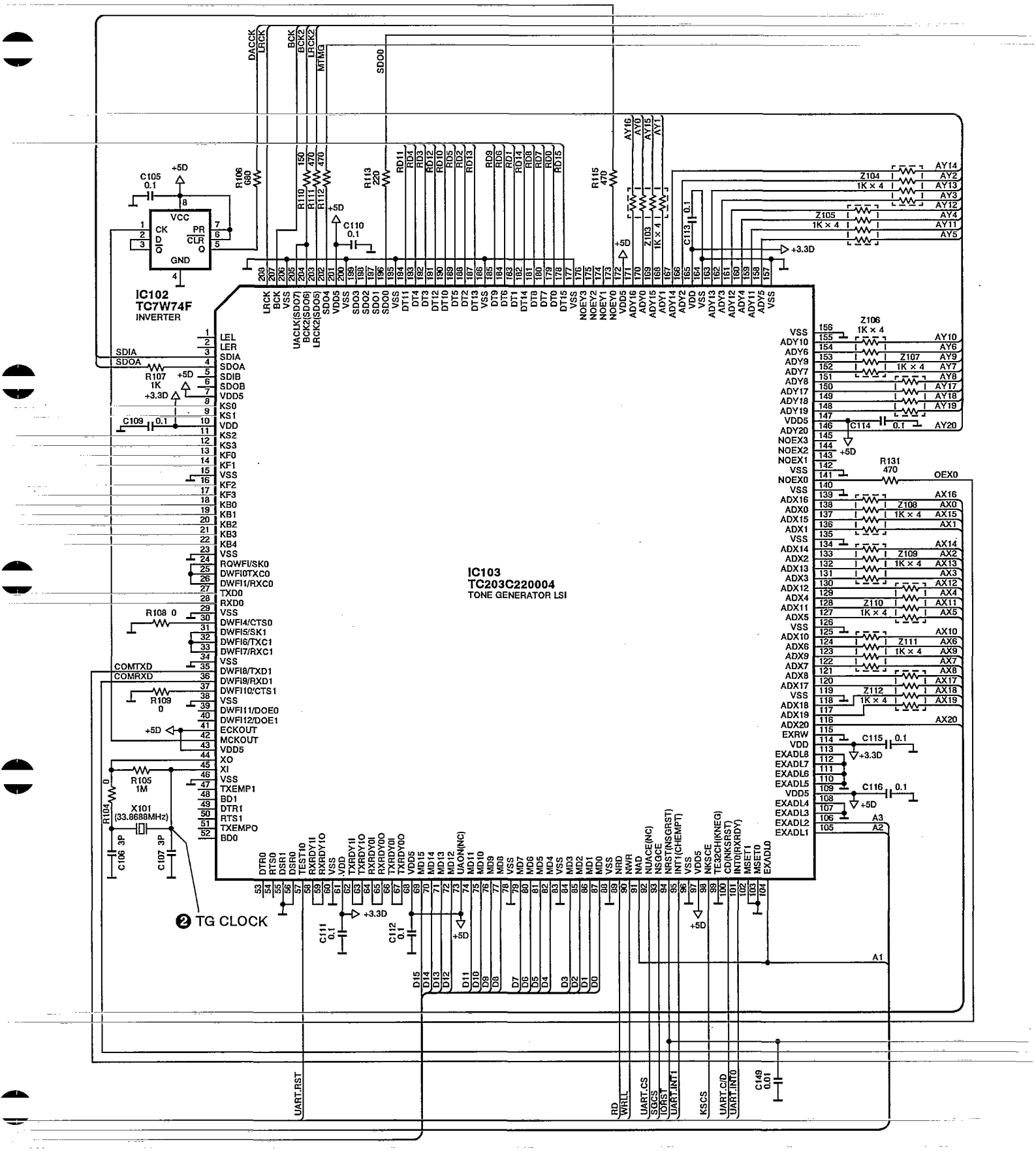


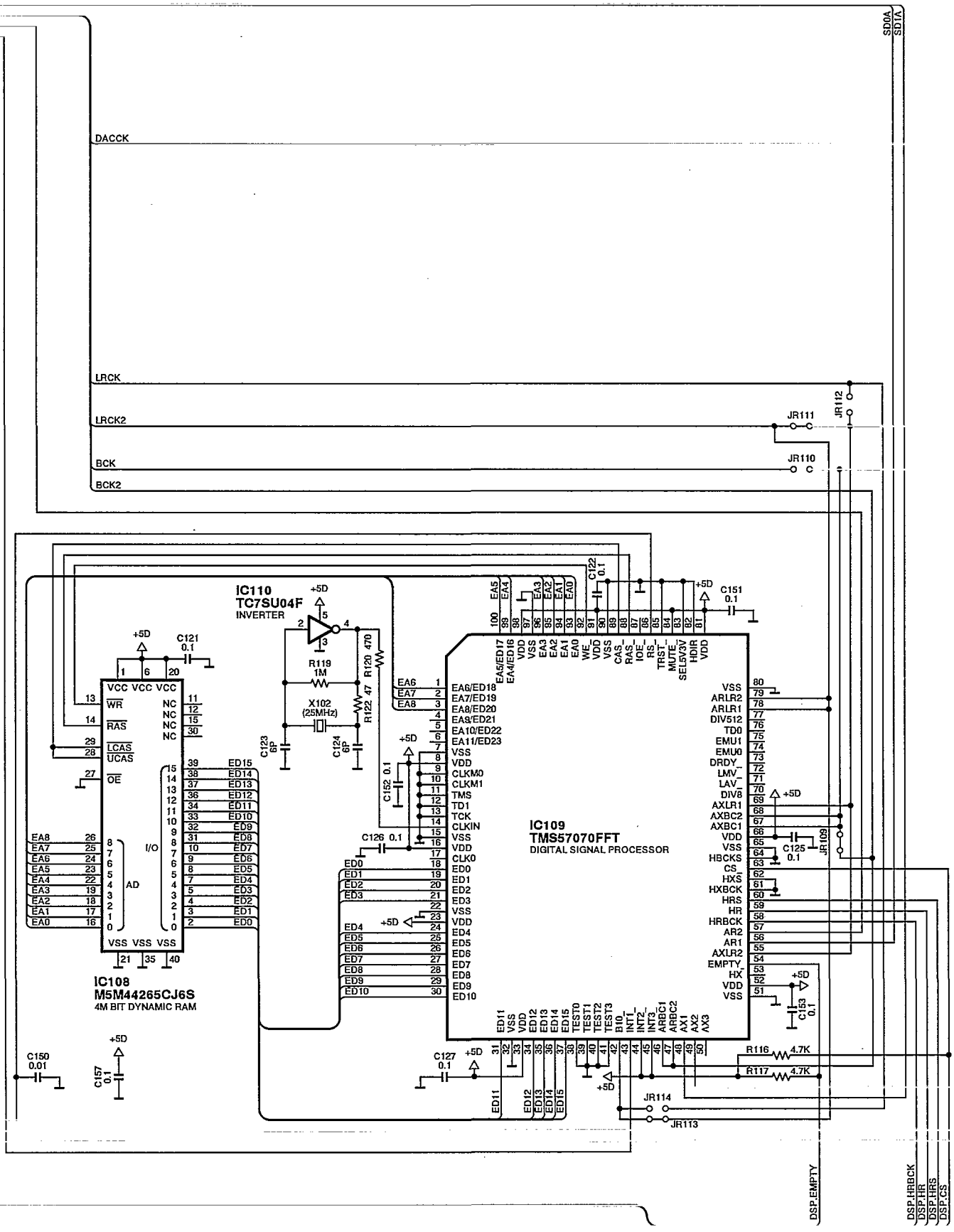

IC6
TMP94C241AF
MAIN CPU
IC12
TC74VHC138AF
3 TO 8 DECODER
IC18
TC7SU04F
INVERTER
Q7
2SD601AQ
(EXCEPT M, XM)
RESET
MOD
BEND
EXP
SGCS
KSCS
UARTCS
FDC,DMAACK
FDCCS

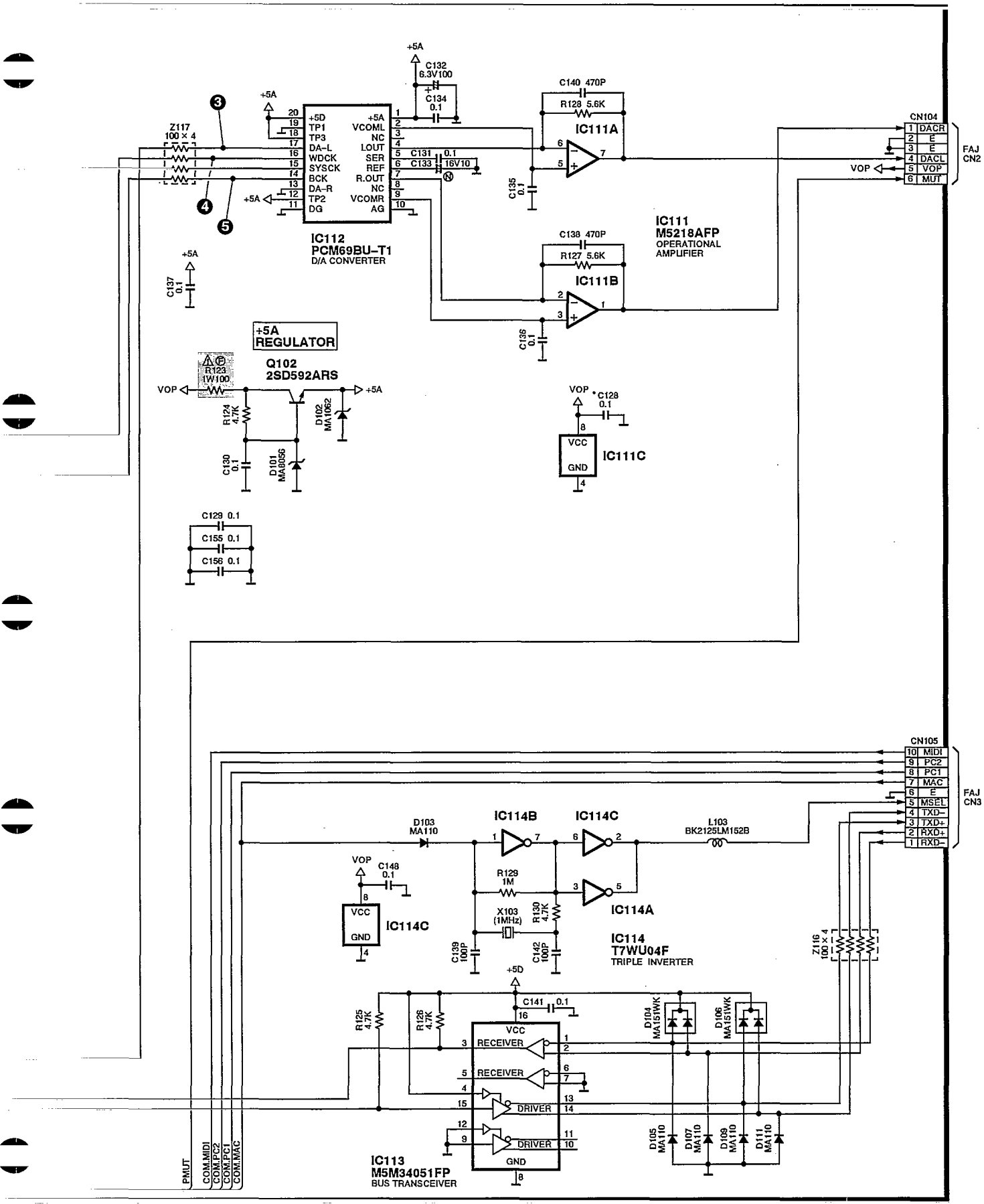

IC15
D72070GF3BE
FLOPPY DISK
CONTROLER
IC20
TC7SH08F
IC19
TC74VHC74FTL
DUAL D FLIP-FLOP
IC16
M66271FP
LCD CONTROLER
IC9
TC74VHC08F
QUAD 2 INPUT
AND GATE
IC9A
IC9B
IC10
TC7SH08F
2 INPUT AND GATE
IC11
M5M44265CJ6S
4M BIT DYNAMIC RAM
Q10,11
2SD601AQ
Q10
Q11
IC1
MN1382RTX
RESET IC
IC2
QVIGFKN16AX1
8M BIT PROGRAM ROM
(ODD)
X3 (24MHz)


IC9
TC74VHC08F
QUAD 2 INPUT
AND GATE
IC9D
IC9C
IC9E
IC13
M5M44265CJ6S
4M BIT DYNAMIC RAM
IC14
QSIGX3C16004
16M BIT
RHYTHM DATA ROM
IC4
QVIGFKN16AX1
8M BIT PROGRAM ROM
(EVEN)
IC5
QSIGX3C08003
8M BIT TABLE DATA
ROM (ODD)
IC7
QSIGX3C08002
8M BIT TABLE DATA
ROM (EVEN)
CN4
FDD
CN6
CN5
CN101
FAJ
CN4
Z25
47 × 4
Z26
47 × 4
Z27
47 × 4
Z24
100 × 4
Z23
100 × 4
IORST
LUCAS
LCAS
+5D
+5BB


G LCDCN CIRCUIT
CN6
CN7
VLCD
VEE
D3
D2
D1
D0
DOFF
VSS
VDD
CP
LOAD
FRM
LCD
CN102
MOD
BEND
+5
E
KF0
KS0
KF1
MKB2 CN4
CN103
KS1
KF2
KS2
KF3
KS3
KB3
KB2
KB1
KB0
KB4
MKB2 CN5
Z113 100 × 4
Z114 100 × 4
Z101 22K × 4
Z102 22K × 4
Z115 470 × 4
R114 100
R135 100
C143 100P
C144 100P
C145 100P
C146 100P
C147 100P
IC104
QSIGX3C24002
16M BIT WAVEFORM ROM
JR102
JR107
C120 0.1
IC101
M5223FPE1
OPERATIONNAL AMPLIFIER
IC101A
IC101C
C102 0.1
Q101
2SD592ARS
IC101B
R101 1K
R102 1K
R103 1K
C101 0.1
C103 0.1
C104 6.3V47
JR104
JR103
JR108
C119 0.1
IC105
QSIGX3C24001
16M BIT WAVEFORM ROM
L101
BK2125LM152B
L102
BK2125LM152B
BEND
MOD
MRXD
MTXD


IC102
TC7W74F
INVERTER
IC103
TC203C220004
TONE GENERATOR LSI
X101
(33.8688MHz)
❷ TG CLOCK
+5D
+3.3D
SDIA
SDOA
COMTXD
COMRXD
UART.RST
UART.CS
UART.INT1
UART.C/D
UART.INTO
KSCS
RD
WRLL


SD0A
SD1A
DACCK
LRCK
LRCK2
BCK
BCK2
JR111
JR112
JR110
IC110
TC7SU04F
INVERTER
IC108
M5M44265CJ6S
4M BIT DYNAMIC RAM
IC109
TMS57070FFT
DIGITAL SIGNAL PROCESSOR
X102
(25MHz)
R119
1M
R120
470
R122
47
C121
0.1
C122
0.1
C123
6P
C124
6P
C125
0.1
C126
0.1
C127
0.1
C150
0.01
C151
0.1
C152
0.1
C153
0.1
C157
0.1
R116
4.7K
R117
4.7K
JR113
JR114
JR109
+5D
DSP.EMPTY
DSP.HRBCK
DSP.HR
DSP.HRS
DSP.CS

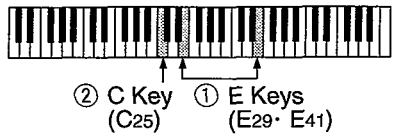

IC112
PCM69BU-T1
D/A CONVERTER
IC111
M5218AFP
OPERATIONAL
AMPLIFIER
IC111A
IC111B
IC111C
+5A
REGULATOR
Q102
2SD592ARS
CN104
DACR
E
E
DACL
VOP
MUT
FAJ
CN2
CN105
MIDI
PC2
PC1
MAC
E
MSEL
TXD-
TXD+
RXD+
RXD-
FAJ
CN3
IC114
T7WU04F
TRIPLE INVERTER
IC114A
IC114B
IC114C
IC113
M5M34051FP
BUS TRANSCEIVER
RECEIVER
DRIVER
PMUT
COM.MIDI
COM.PC2
COM.PC1
COM.MAC

■ Measuring Condition of MAIN P.C.B.

Check Point ❷~❺

Set to the self-diagnostic mode followings.

- While pressing two E keys (①) simultaneously, turn on the power switch.
- SOUND ..... SYNTH & DANCE
- Main Volume ..... MAX
- Keyboard ..... C_{25} (②)

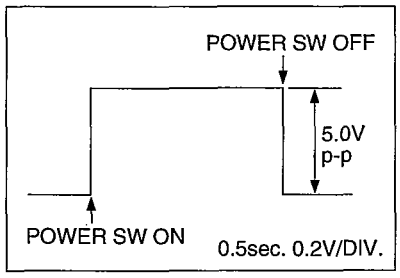


Check Point ❶

Set the initial setting mode (Refer to page I-5)

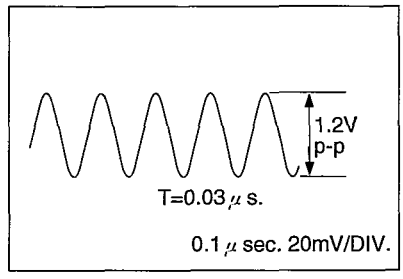
- SOUND ..... SYNTH & DANCE
- Main Volume ..... MAX

❶ $\overline{\text{RESET}}$

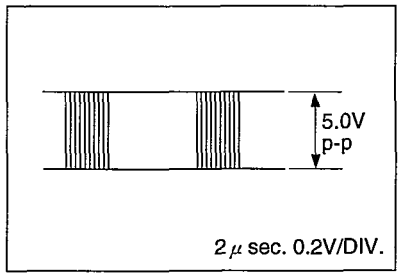


- Power SW ..... ON → OFF

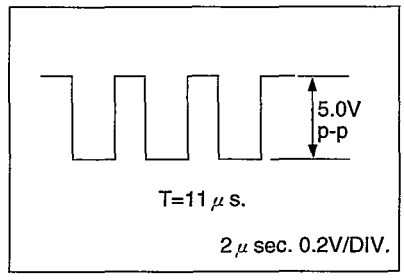
❷ TG CLOCK



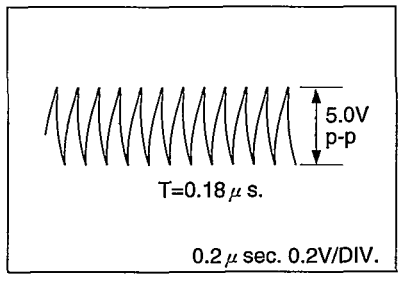
❸

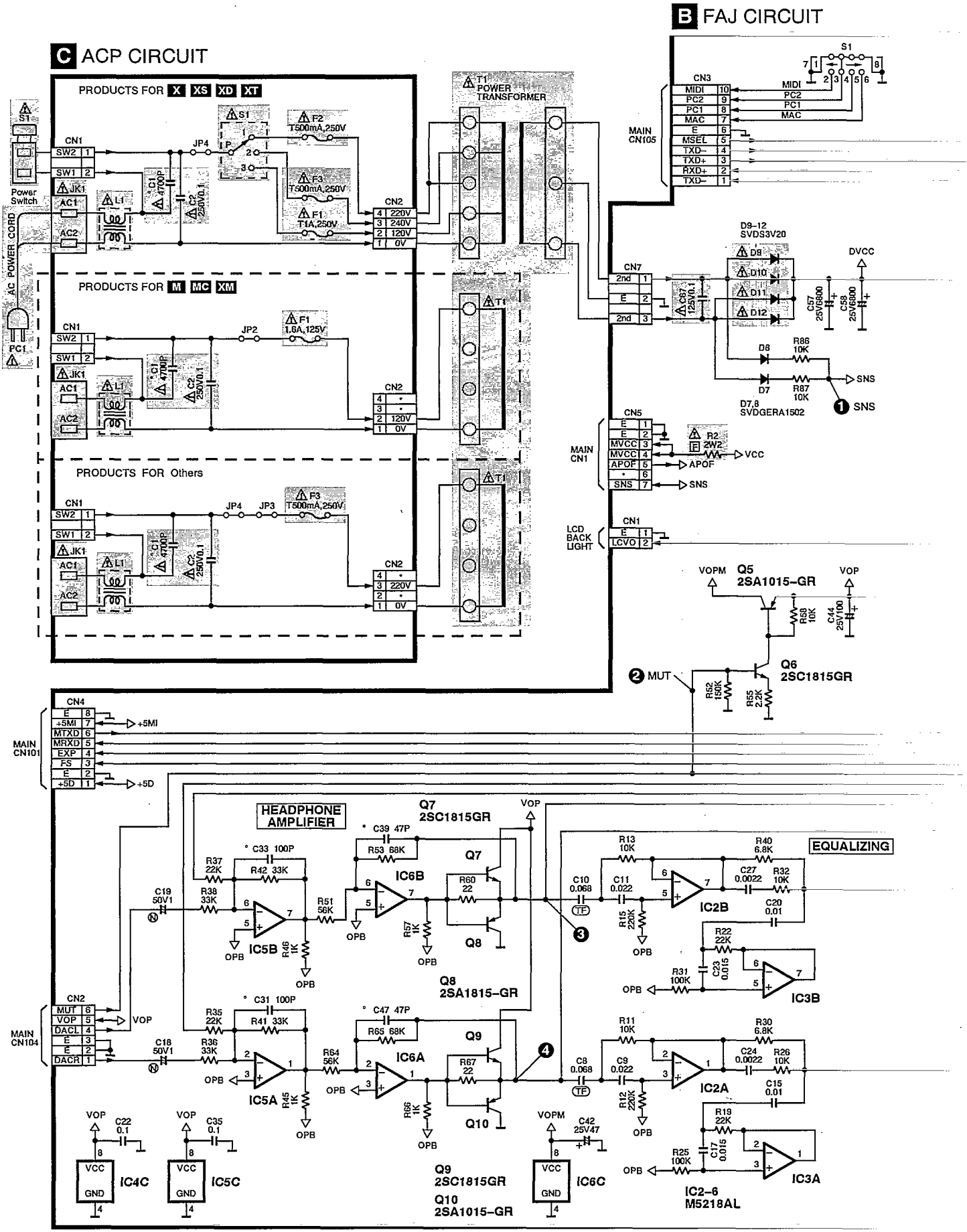


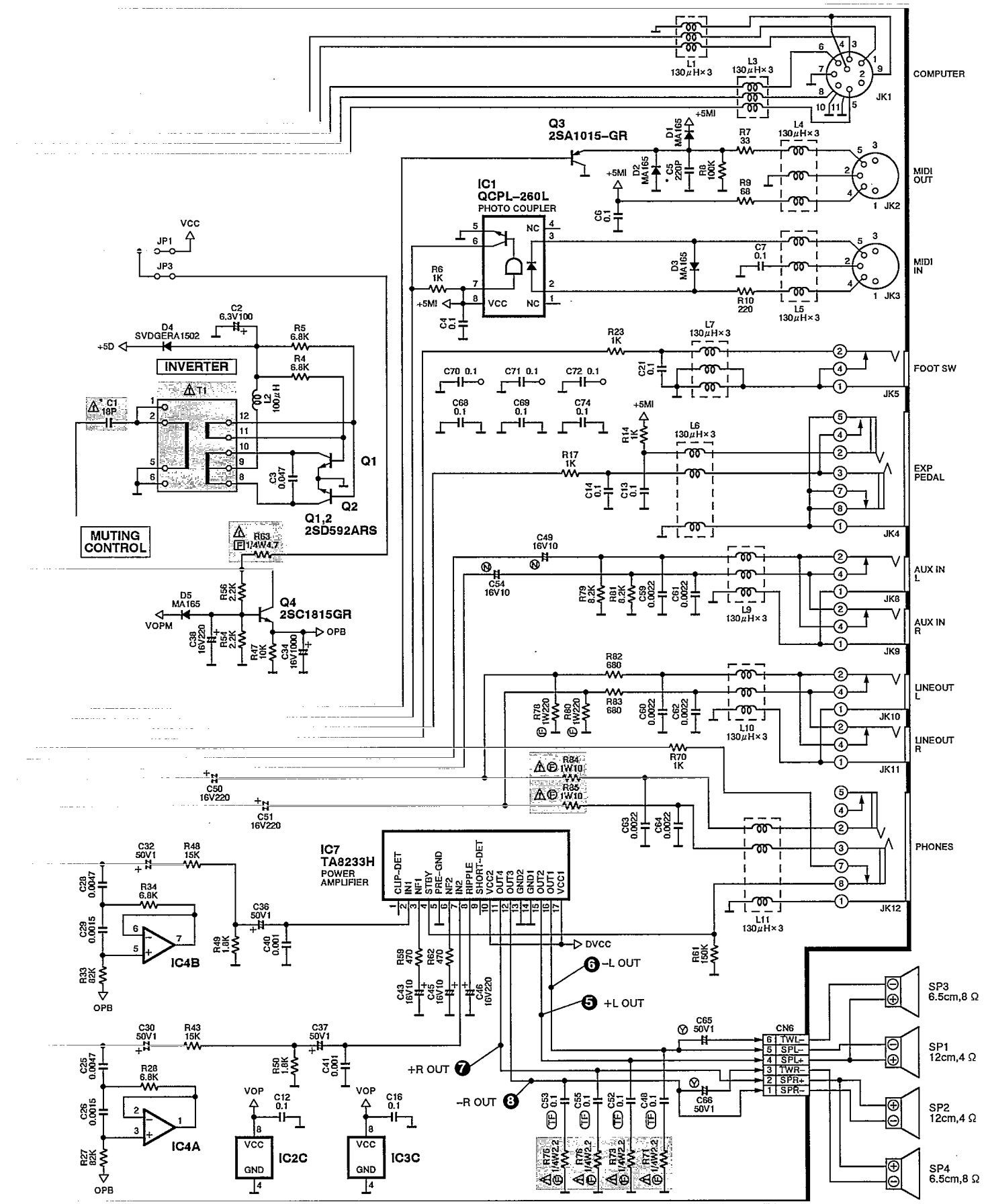
❹



❺




B FAJ CIRCUIT
C ACP CIRCUIT
PRODUCTS FOR X XS XD XT
PRODUCTS FOR M MC XM
PRODUCTS FOR Others
T1 POWER TRANSFORMER
AC POWER CORD
Power Switch
PC1
CN1
CN2
CN3
CN4
CN5
CN7
MAIN CN105
MAIN CN101
MAIN CN104
MAIN CN1
LCD BACK LIGHT
JP4
JP2
JP3
F1 T1A,250V
F1 1.6A,125V
F2 T500mA,250V
F3 T500mA,250V
D9-12 SVDS3V20
D7,8 SVDGERA1502
DVCC
VCC
APOF
SNS
VOPM
VOP
Q5 2SA1015-GR
Q6 2SC1815GR
MUT
HEADPHONE AMPLIFIER
Q7 2SC1815GR
Q8 2SA1815-GR
Q9 2SC1815GR
Q10 2SA1015-GR
EQUALIZING
IC5B
IC6B
IC5A
IC6A
IC2B
IC3B
IC2A
IC3A
IC4C
IC5C
IC6C
IC2-6 M5218AL
OPB
+5MI
+5D

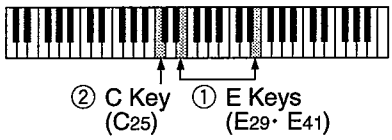

COMPUTER
JK1
MIDI OUT
JK2
MIDI IN
JK3
FOOT SW
JK5
EXP PEDAL
JK4
AUX IN L
JK8
AUX IN R
JK9
LINEOUT L
JK10
LINEOUT R
JK11
PHONES
JK12
Q3 2SA1015-GR
IC1 QCPL-260L PHOTO COUPLER
INVERTER
MUTING CONTROL
Q1
Q2
Q1,2 2SD592ARS
Q4 2SC1815GR
IC7 TA8233H POWER AMPLIFIER
IC4B
IC4A
IC2C
IC3C
DVCC
-L OUT
+L OUT
+R OUT
-R OUT
CN6
SP3 6.5cm,8 Ω
SP1 12cm,4 Ω
SP2 12cm,4 Ω
SP4 6.5cm,8 Ω

■ Measuring Condition of FAJ P.C.B.

Check Point ❷~❺

Set to the self-diagnostic mode followings.

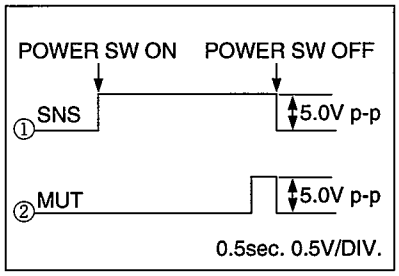
- While pressing two E keys (①) simultaneously, turn on the power switch.
- SOUND ..... SYNTH & DANCE
- Main Volume ..... MAX
- Keyboard ..... C_{25} (②)



Check Point ❶, ❷

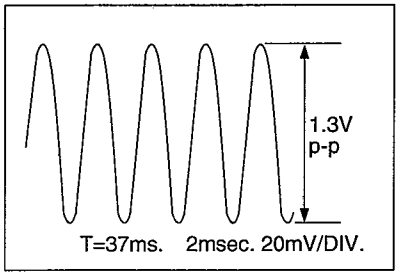
Set the initial setting mode (Refer to page I-5)

❶ SNS, ❷ MUT

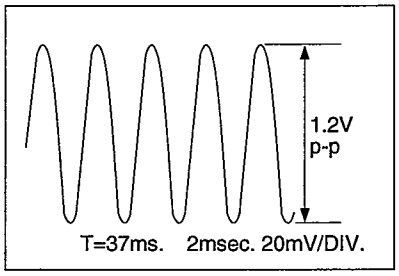


• Power SW ..... ON → OFF

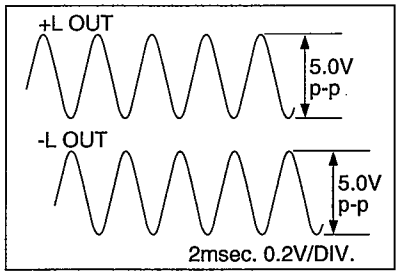
❸



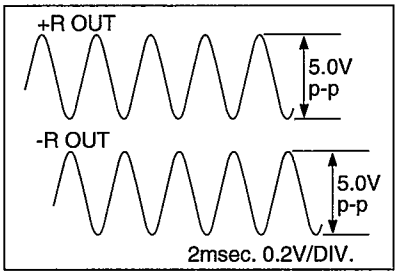
❹



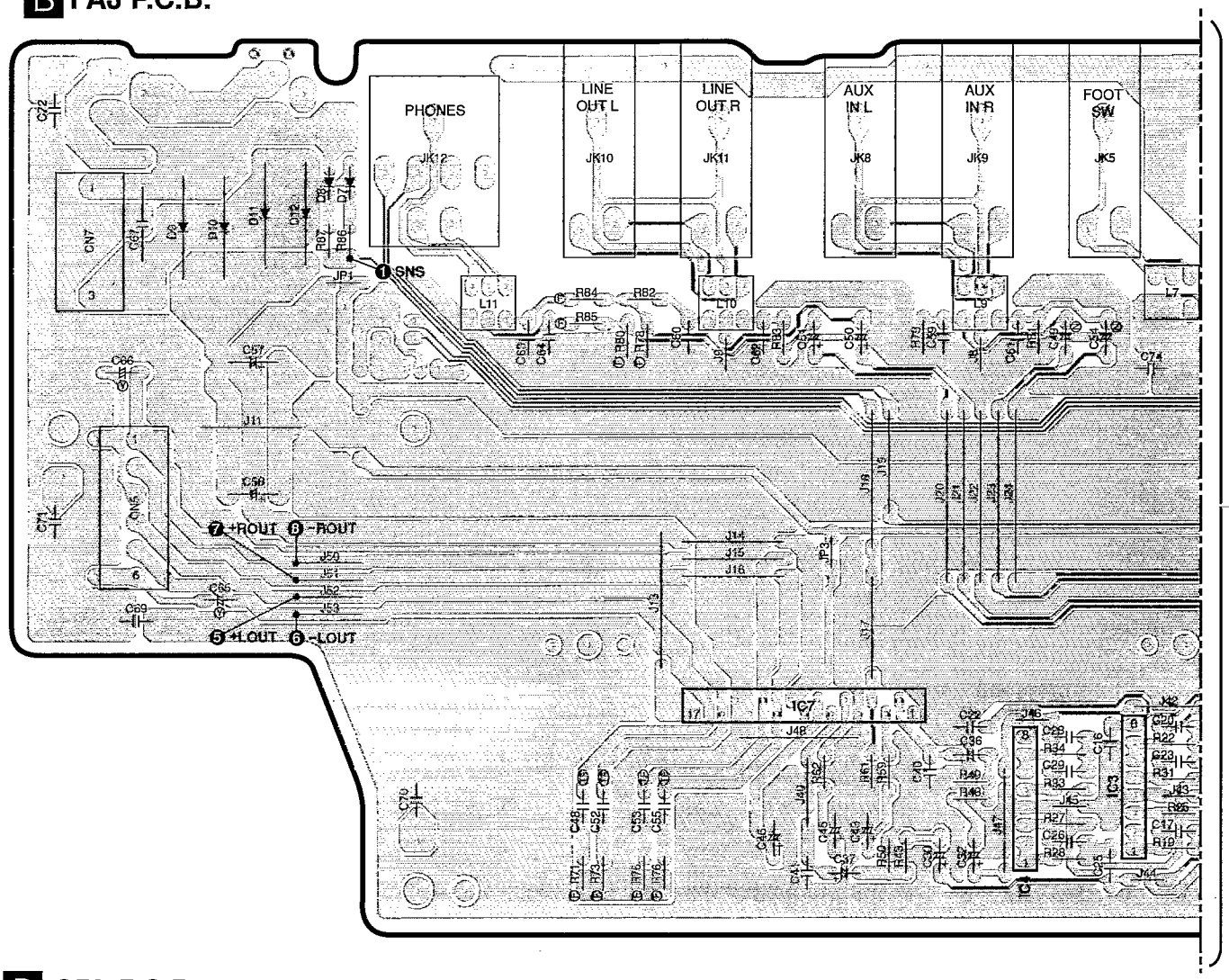
❺ +L OUT, ❻ −L OUT



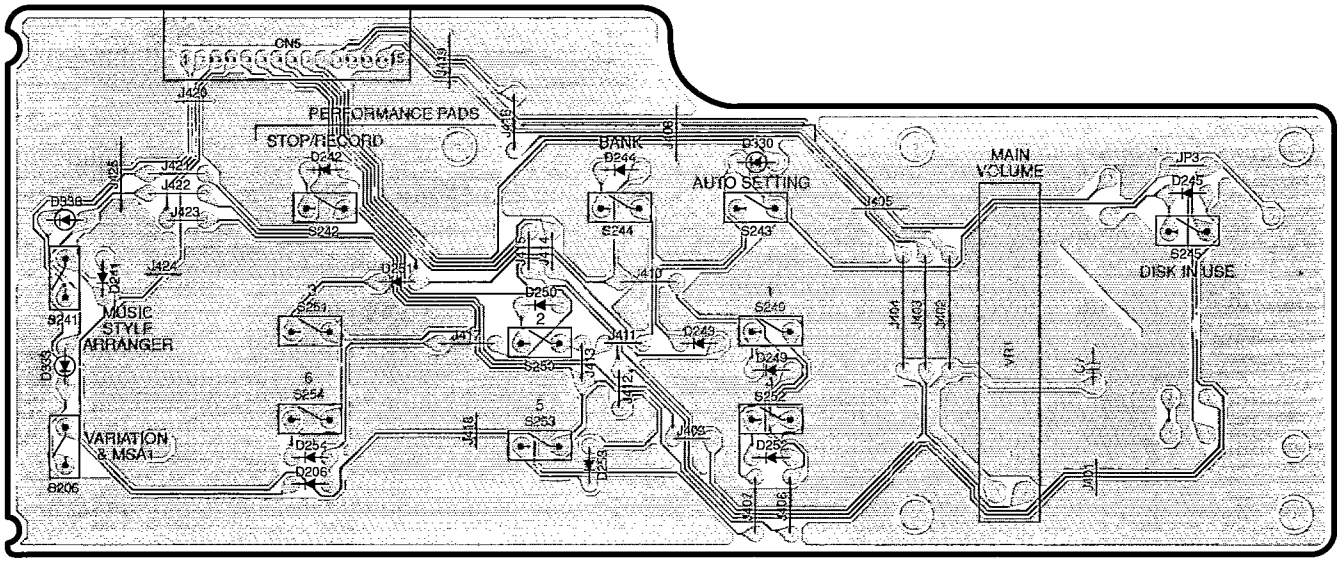
❼ +R OUT, ❽ −R OUT

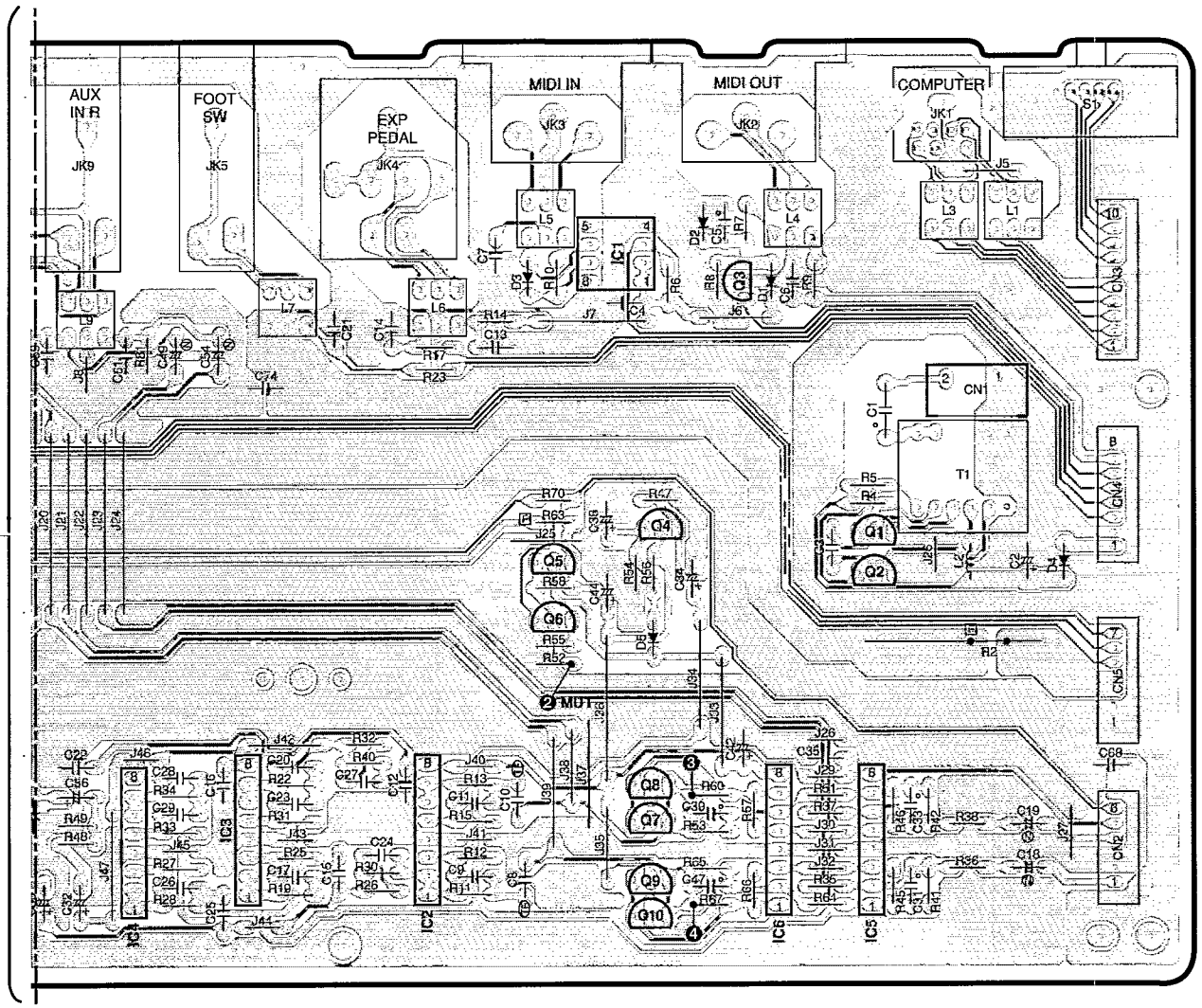


B FAJ P.C.B.



D CPL P.C.B.




AUX IN R
JK9
FOOT SW
JK5
EXP PEDAL
JK4
MIDI IN
JK3
MIDI OUT
JK6
COMPUTER
JK1
S1
CN1
T1
CN3
CN4
CN5
CN2
IC1
IC2
IC3
IC5
IC6
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
R2
R5
R4
R70
R63
R47
R58
R56
R55
R52
R60
R65
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33
C34
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C36
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C38
C39
C40
C41
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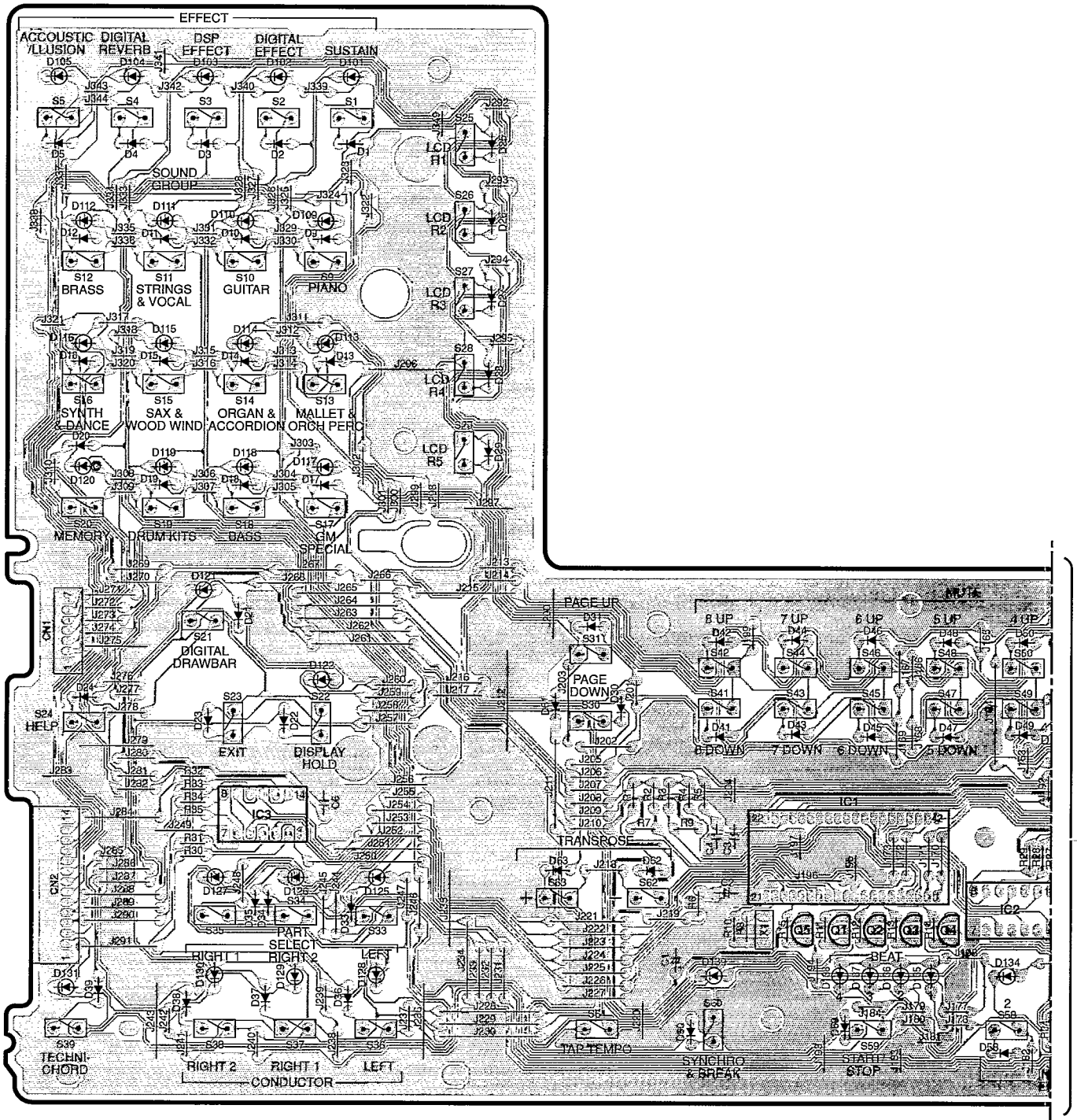
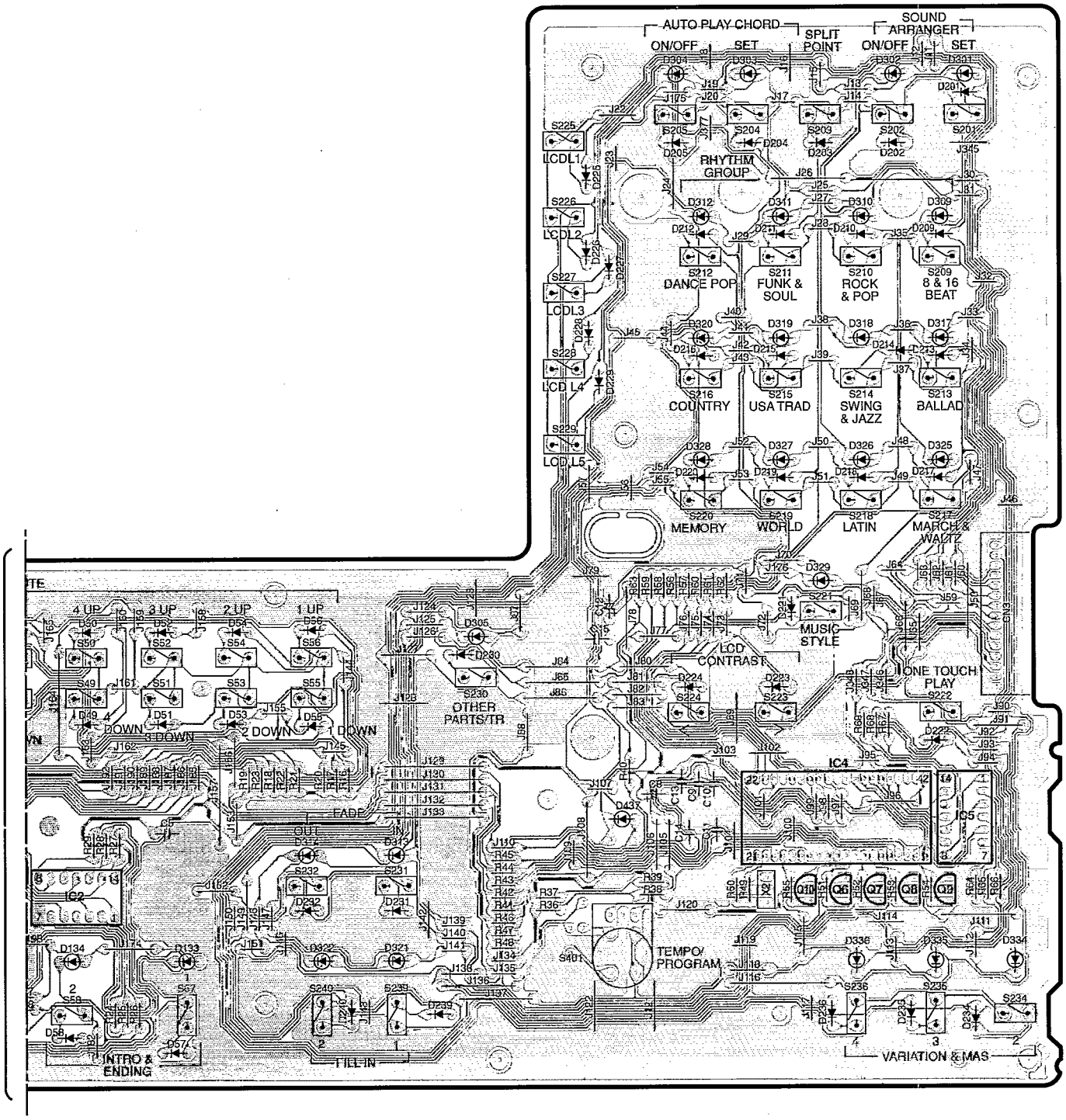
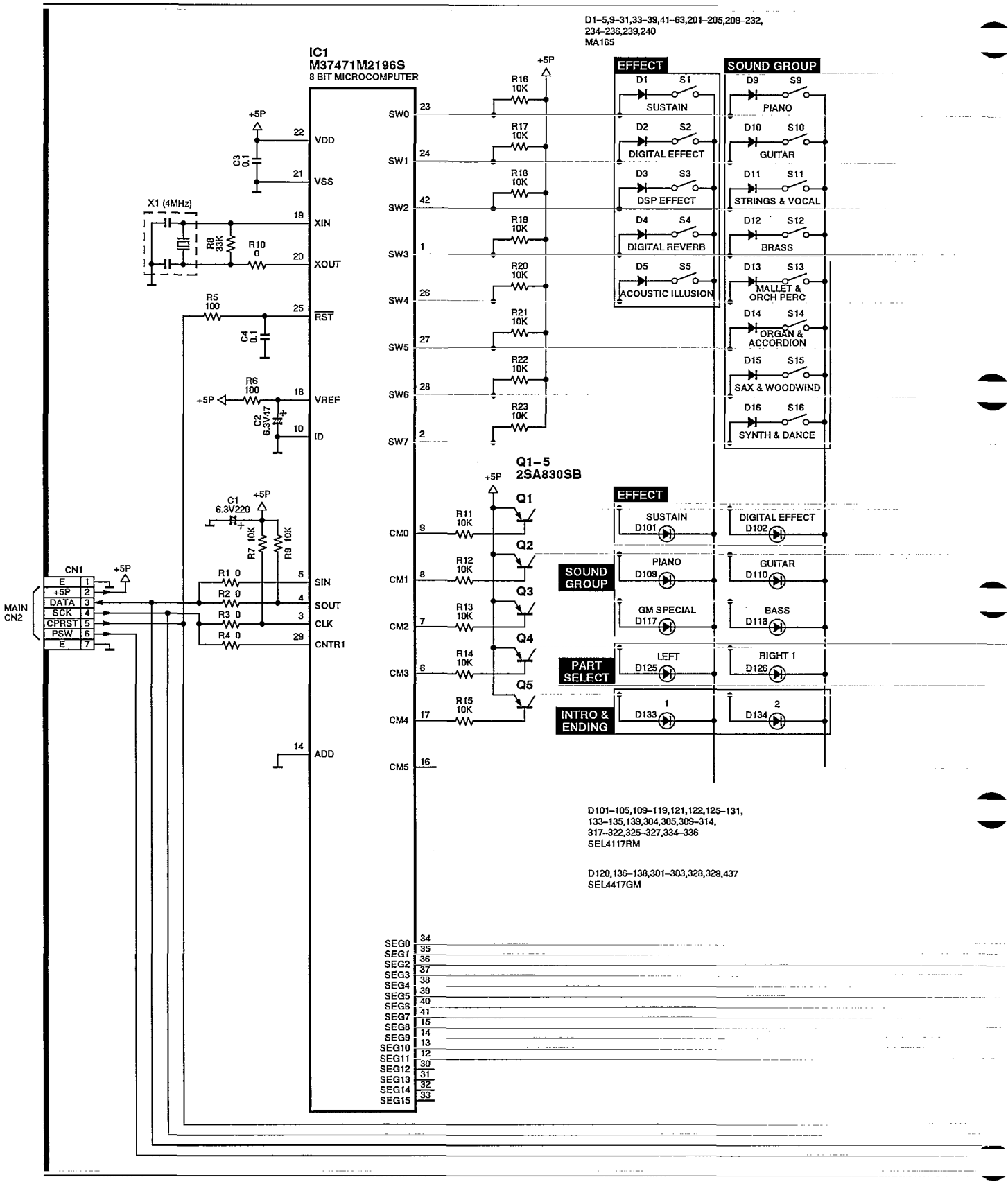
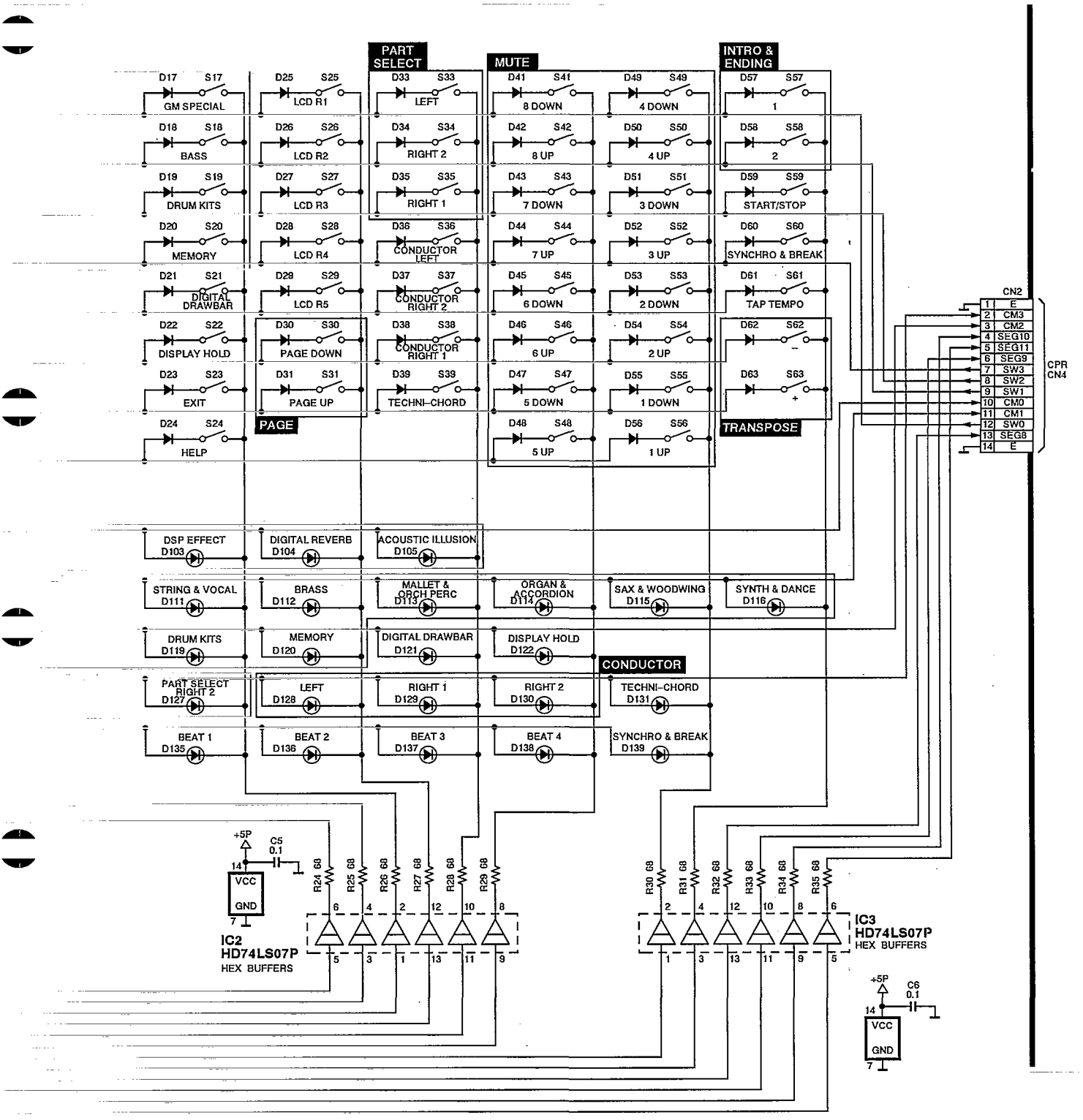
C47
C48
C49
C50
C51
C52
C53
C54
C55
C56
C57
C58
C59
C60
C61
C62
C63
C64
C65
C66
C67
C68
L1
L3
L4
L5
L6
L7
L8
L9
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
D16
D17
D18
D19
D20
D21
D22
D23
D24
D25
D26
D27
D28
D29
D30
D31
D32
D33
D34
D35
D36
D37
D38
D39
D40

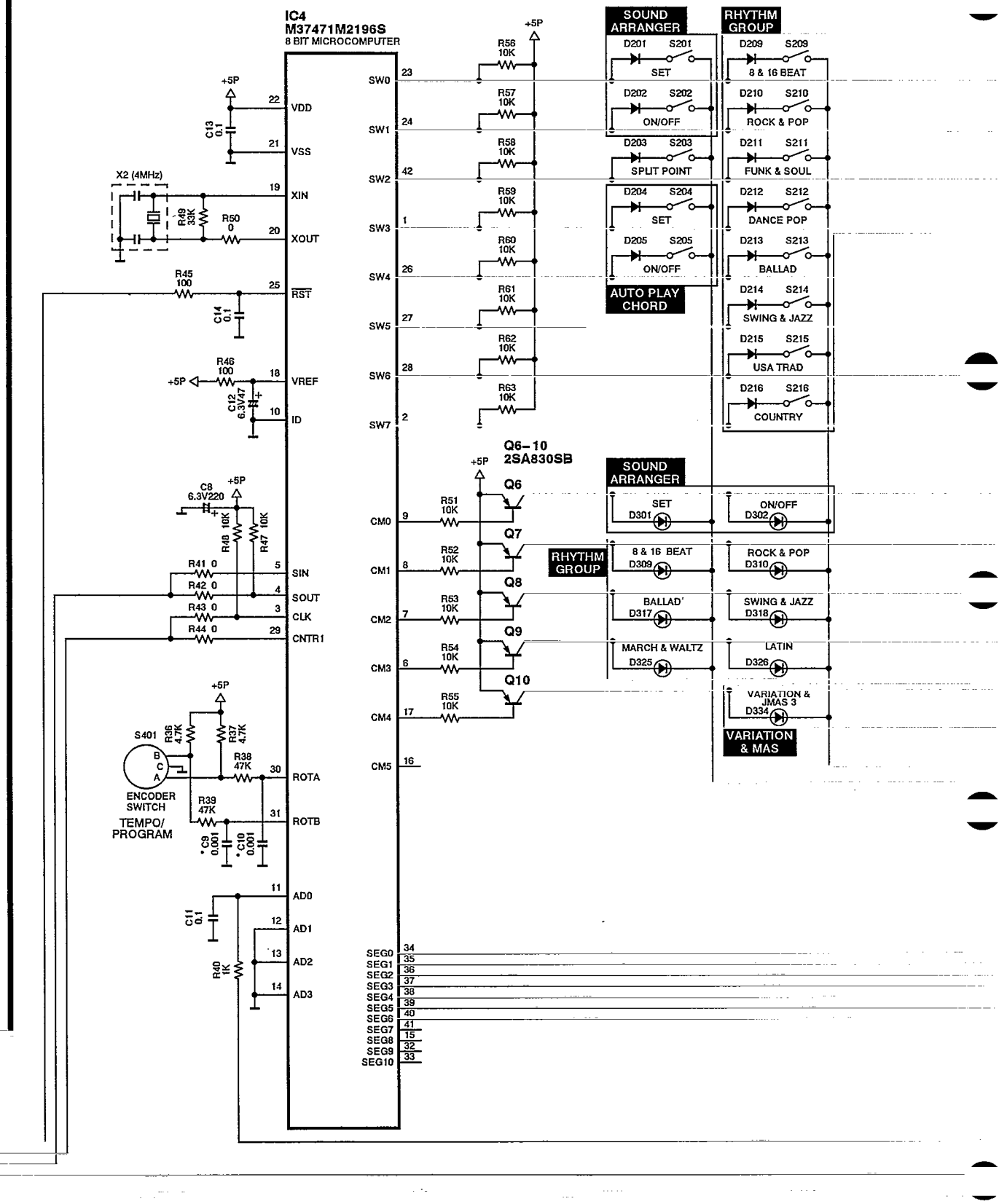
E CPC P.C.B.

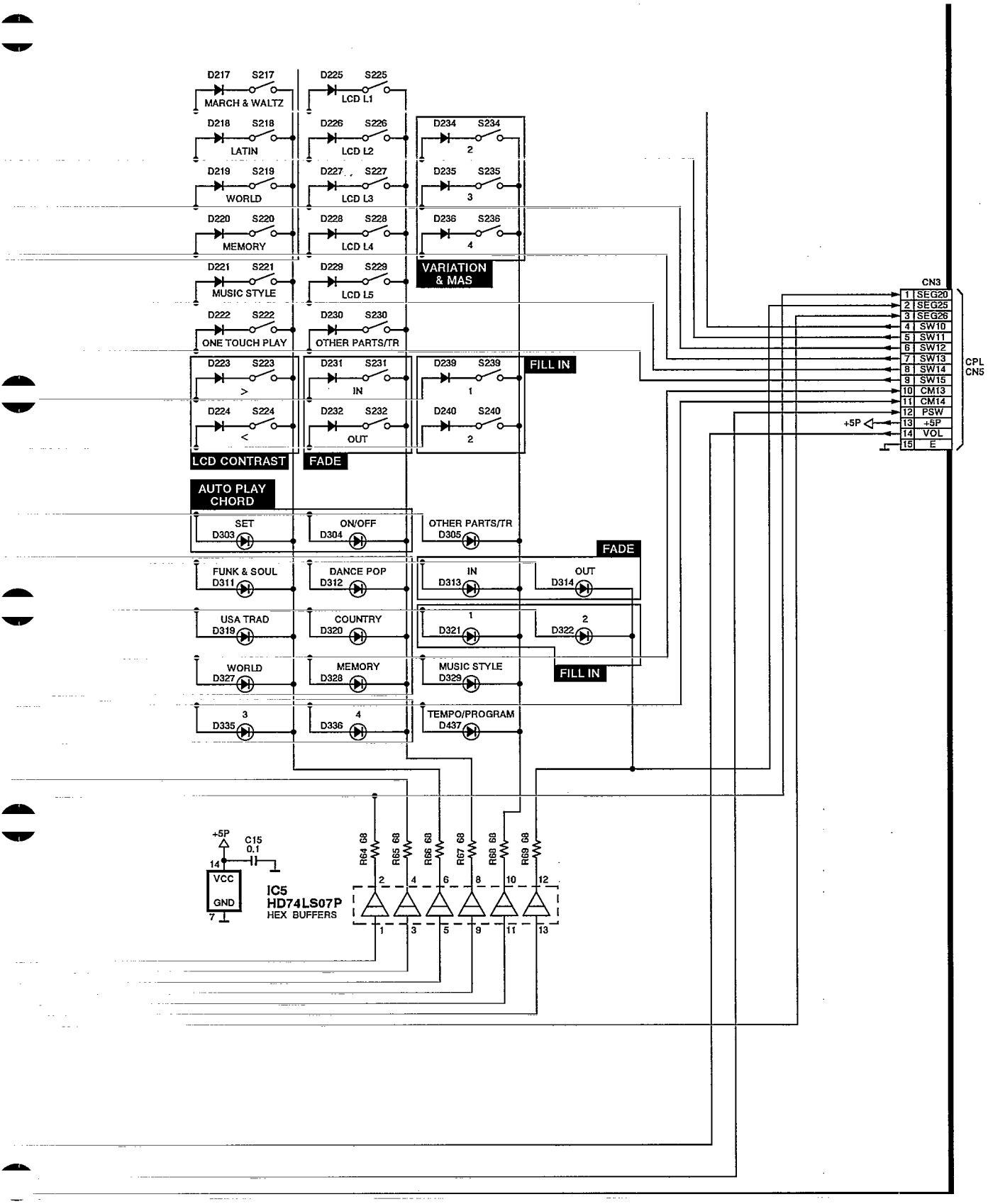

EFFECT
ACCOUSTIC /LLUSION
DIGITAL REVERB
DSP EFFECT
DIGITAL EFFECT
SUSTAIN
SOUND GROUP
S12 BRASS
S11 STRINGS & VOCAL
S10 GUITAR
S9 PIANO
S16 SYNTH & DANCE
S15 SAX & WOOD WIND
S14 ORGAN & ACCORDION
S13 MALLET & ORCH PERC
S20 MEMORY
S19 DRUM KITS
S18 BASS
S17 GM SPECIAL
S21 DIGITAL DRAWBAR
S24 HELP
EXIT
DISPLAY HOLD
PART SELECT
RIGHT 1
RIGHT 2
LEFT
S39 TECHNI-CHORD
CONDUCTOR
LCD R1
LCD R2
LCD R3
LCD R4
LCD R5
PAGE UP
PAGE DOWN
TRANSPOSE
TAP TEMPO
SYNCHRO & BREAK
START/ STOP
BEAT
8 UP
7 UP
6 UP
5 UP
4 UP
8 DOWN
7 DOWN
6 DOWN
5 DOWN
IC1
IC2
IC3


AUTO PLAY CHORD
ON/OFF
SET
SPLIT POINT
SOUND ARRANGER
ON/OFF
SET
RHYTHM GROUP
S212 DANCE POP
S211 FUNK & SOUL
S210 ROCK & POP
S209 8 & 16 BEAT
S216 COUNTRY
S215 USA TRAD
S214 SWING & JAZZ
S213 BALLAD
S220 MEMORY
S219 WORLD
S218 LATIN
S217 MARCH & WALTZ
MUSIC STYLE
LCD CONTRAST
ONE TOUCH PLAY
OTHER PARTS/TR
TEMPO/ PROGRAM
4 UP
3 UP
2 UP
1 UP
4 DOWN
3 DOWN
2 DOWN
1 DOWN
FADE
IN
OUT
INTRO & ENDING
FILL-IN
VARIATION & MAS

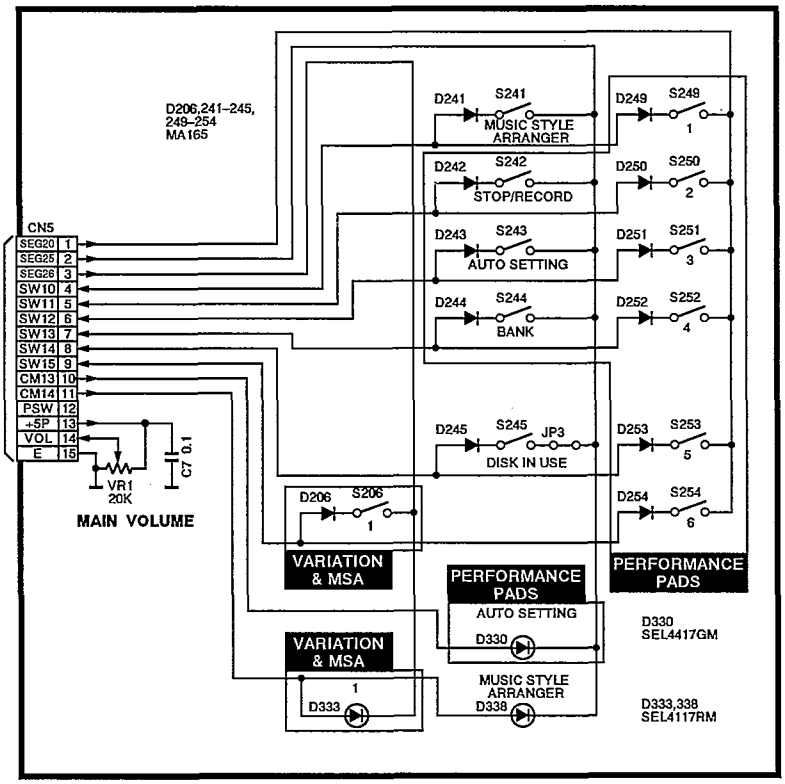

D1–5,9–31,33–39,41–63,201–205,209–232,
234–236,239,240
MA165
IC1
M37471M2196S
8 BIT MICROCOMPUTER
VDD
VSS
XIN
XOUT
RST
VREF
ID
SIN
SOUT
CLK
CNTR1
ADD
SW0
SW1
SW2
SW3
SW4
SW5
SW6
SW7
CM0
CM1
CM2
CM3
CM4
CM5
SEG0
SEG1
SEG2
SEG3
SEG4
SEG5
SEG6
SEG7
SEG8
SEG9
SEG10
SEG11
SEG12
SEG13
SEG14
SEG15
X1 (4MHz)
+5P
C3 0.1
C4 0.1
C1 6.3V220
C2 6.3V47
R5 100
R6 100
R7 10K
R8 33K
R9 10K
R10 0
R1 0
R2 0
R3 0
R4 0
R11 10K
R12 10K
R13 10K
R14 10K
R15 10K
R16 10K
R17 10K
R18 10K
R19 10K
R20 10K
R21 10K
R22 10K
R23 10K
CN1
E
+5P
DATA
SCK
CPRST
PSW
E
MAIN CN2
Q1–5
2SA830SB
Q1
Q2
Q3
Q4
Q5
EFFECT
D1 S1 SUSTAIN
D2 S2 DIGITAL EFFECT
D3 S3 DSP EFFECT
D4 S4 DIGITAL REVERB
D5 S5 ACOUSTIC ILLUSION
SOUND GROUP
D9 S9 PIANO
D10 S10 GUITAR
D11 S11 STRINGS & VOCAL
D12 S12 BRASS
D13 S13 MALLET & ORCH PERC
D14 S14 ORGAN & ACCORDION
D15 S15 SAX & WOODWIND
D16 S16 SYNTH & DANCE
EFFECT
SUSTAIN D101
DIGITAL EFFECT D102
SOUND GROUP
PIANO D109
GUITAR D110
GM SPECIAL D117
BASS D118
PART SELECT
LEFT D125
RIGHT 1 D126
INTRO & ENDING
1 D133
2 D134
D101–105,109–119,121,122,125–131,
133–135,139,304,305,309–314,
317–322,325–327,334–336
SEL4117RM
D120,136–138,301–303,328,329,437
SEL4417GM


PART SELECT
MUTE
INTRO & ENDING
D17 S17 GM SPECIAL
D25 S25 LCD R1
D33 S33 LEFT
D41 S41 8 DOWN
D49 S49 4 DOWN
D57 S57 1
D18 S18 BASS
D26 S26 LCD R2
D34 S34 RIGHT 2
D42 S42 8 UP
D50 S50 4 UP
D58 S58 2
D19 S19 DRUM KITS
D27 S27 LCD R3
D35 S35 RIGHT 1
D43 S43 7 DOWN
D51 S51 3 DOWN
D59 S59 START/STOP
D20 S20 MEMORY
D28 S28 LCD R4
D36 S36 CONDUCTOR LEFT
D44 S44 7 UP
D52 S52 3 UP
D60 S60 SYNCHRO & BREAK
D21 S21 DIGITAL DRAWBAR
D29 S29 LCD R5
D37 S37 CONDUCTOR RIGHT 2
D45 S45 6 DOWN
D53 S53 2 DOWN
D61 S61 TAP TEMPO
D22 S22 DISPLAY HOLD
D30 S30 PAGE DOWN
D38 S38 CONDUCTOR RIGHT 1
D46 S46 6 UP
D54 S54 2 UP
D62 S62 -
D23 S23 EXIT
D31 S31 PAGE UP
D39 S39 TECHNI-CHORD
D47 S47 5 DOWN
D55 S55 1 DOWN
D63 S63 +
D24 S24 HELP
PAGE
D48 S48 5 UP
D56 S56 1 UP
TRANSPOSE
CN2
1 E
2 CM3
3 CM2
4 SEG10
5 SEG11
6 SEG9
7 SW3
8 SW2
9 SW1
10 CM0
11 CM1
12 SW0
13 SEG8
14 E
CPR CN4
DSP EFFECT D103
DIGITAL REVERB D104
ACOUSTIC ILLUSION D105
STRING & VOCAL D111
BRASS D112
MALLET & ORCH PERC D113
ORGAN & ACCORDION D114
SAX & WOODWING D115
SYNTH & DANCE D116
DRUM KITS D119
MEMORY D120
DIGITAL DRAWBAR D121
DISPLAY HOLD D122
CONDUCTOR
PART SELECT RIGHT 2 D127
LEFT D128
RIGHT 1 D129
RIGHT 2 D130
TECHNI-CHORD D131
BEAT 1 D135
BEAT 2 D136
BEAT 3 D137
BEAT 4 D138
SYNCHRO & BREAK D139
+5P
C5 0.1
VCC
GND
IC2
HD74LS07P
HEX BUFFERS
R24 68
R25 68
R26 68
R27 68
R28 68
R29 68
R30 68
R31 68
R32 68
R33 68
R34 68
R35 68
IC3
HD74LS07P
HEX BUFFERS
C6 0.1

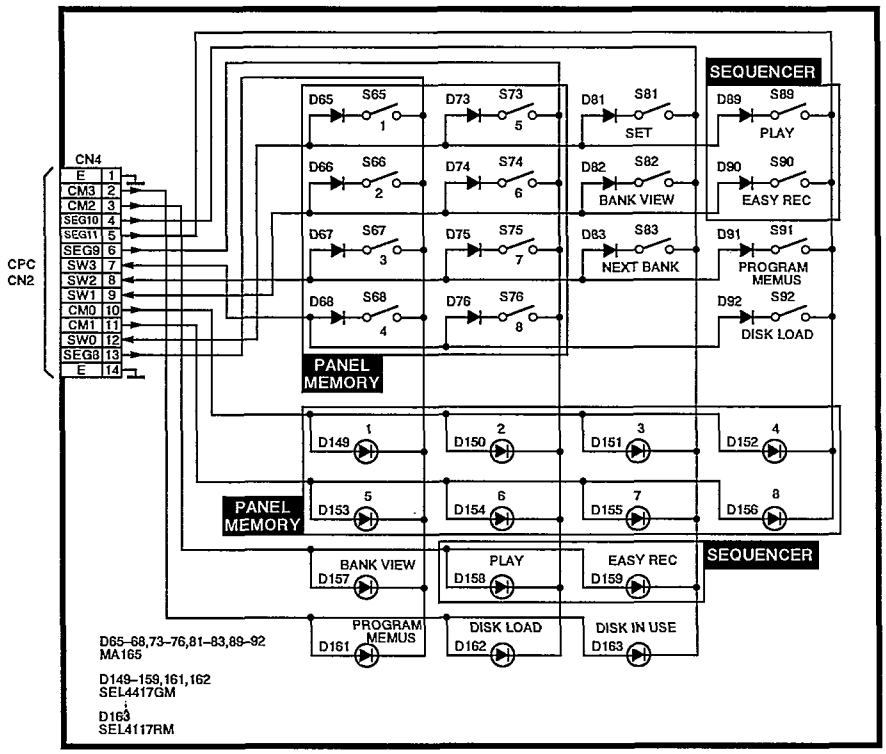

IC4
M37471M2196S
8 BIT MICROCOMPUTER
VDD
VSS
XIN
XOUT
RST
VREF
ID
SIN
SOUT
CLK
CNTR1
ROTA
ROTB
AD0
AD1
AD2
AD3
SW0
SW1
SW2
SW3
SW4
SW5
SW6
SW7
CM0
CM1
CM2
CM3
CM4
CM5
SEG0
SEG1
SEG2
SEG3
SEG4
SEG5
SEG6
SEG7
SEG8
SEG9
SEG10
X2 (4MHz)
ENCODER SWITCH
TEMPO/ PROGRAM
Q6–10
2SA830SB
SOUND ARRANGER
RHYTHM GROUP
AUTO PLAY CHORD
SET
ON/OFF
SPLIT POINT
8 & 16 BEAT
ROCK & POP
FUNK & SOUL
DANCE POP
BALLAD
SWING & JAZZ
USA TRAD
COUNTRY
BALLAD'
MARCH & WALTZ
LATIN
VARIATION & JMAS 3
VARIATION & MAS


D217 S217
MARCH & WALTZ
D218 S218
LATIN
D219 S219
WORLD
D220 S220
MEMORY
D221 S221
MUSIC STYLE
D222 S222
ONE TOUCH PLAY
D223 S223
>
D224 S224
<
LCD CONTRAST
D225 S225
LCD L1
D226 S226
LCD L2
D227 S227
LCD L3
D228 S228
LCD L4
D229 S229
LCD L5
D230 S230
OTHER PARTS/TR
D231 S231
IN
D232 S232
OUT
FADE
D234 S234
2
D235 S235
3
D236 S236
4
VARIATION & MAS
D239 S239
1
D240 S240
2
FILL IN
CN3
1 SEG20
2 SEG25
3 SEG26
4 SW10
5 SW11
6 SW12
7 SW13
8 SW14
9 SW15
10 CM13
11 CM14
12 PSW
13 +5P
14 VOL
15 E
CPL CN5
+5P
AUTO PLAY CHORD
SET D303
ON/OFF D304
OTHER PARTS/TR D305
FUNK & SOUL D311
DANCE POP D312
IN D313
OUT D314
FADE
USA TRAD D319
COUNTRY D320
1 D321
2 D322
WORLD D327
MEMORY D328
MUSIC STYLE D329
FILL IN
3 D335
4 D336
TEMPO/PROGRAM D437
+5P
C15 0.1
14
VCC
GND
7
IC5
HD74LS07P
HEX BUFFERS
R64 68
R65 68
R66 68
R67 68
R68 68
R69 68
2 4 6 8 10 12
1 3 5 9 11 13

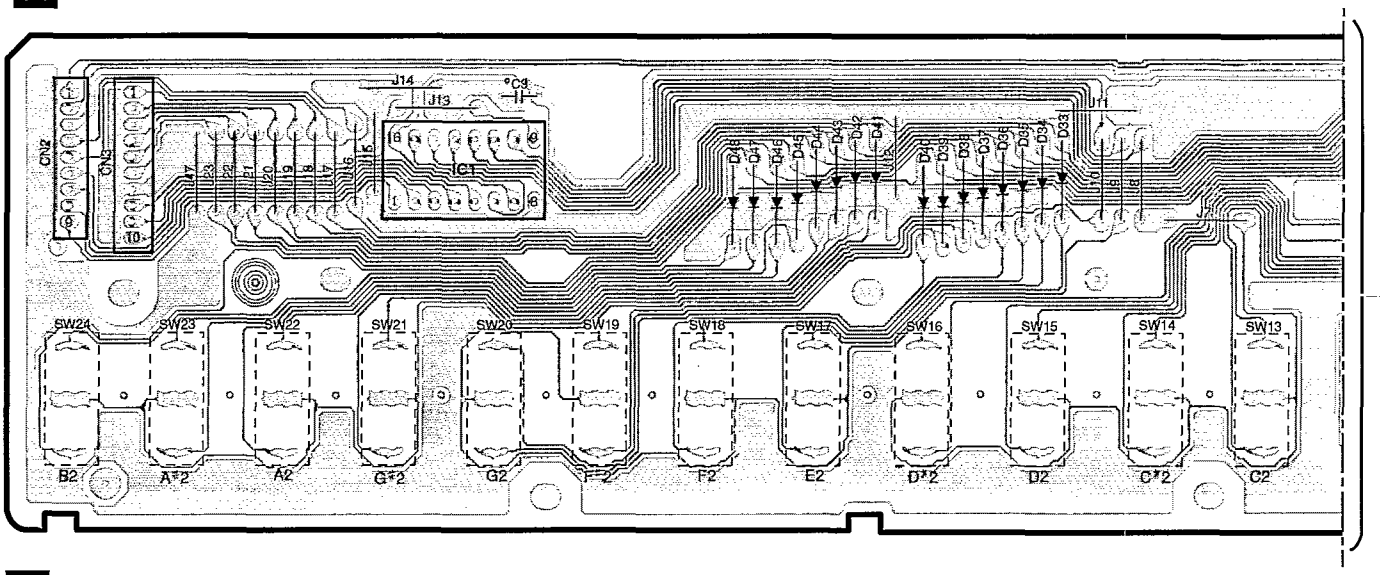
D CPL CIRCUIT



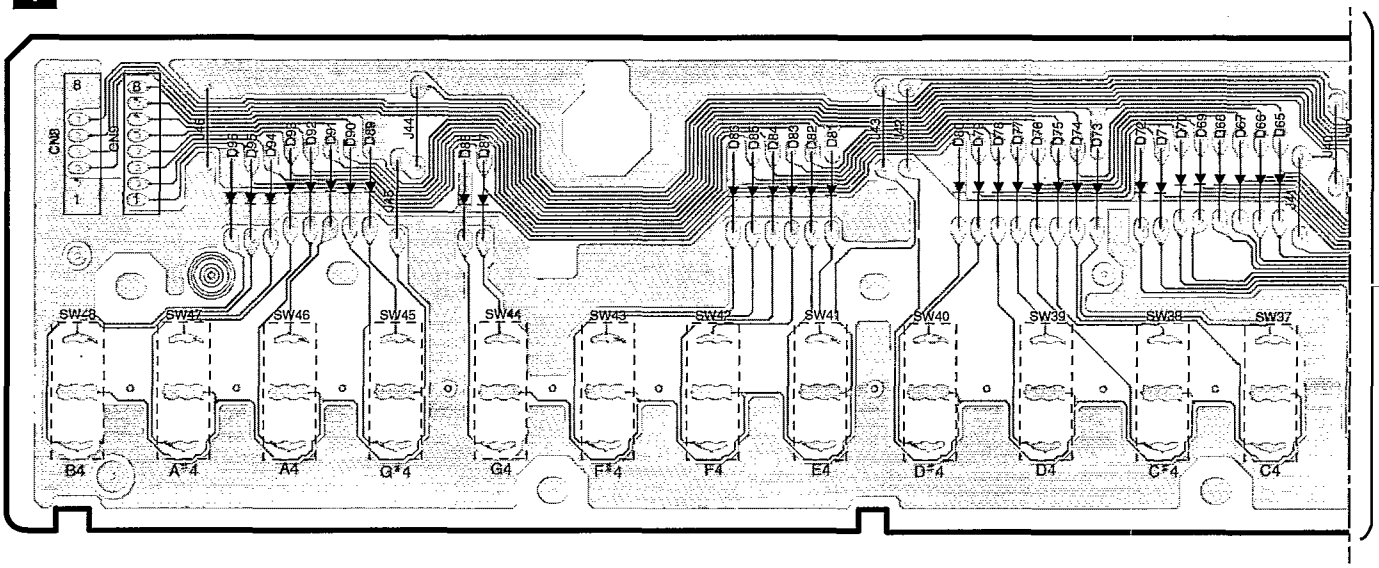
F CPR CIRCUIT



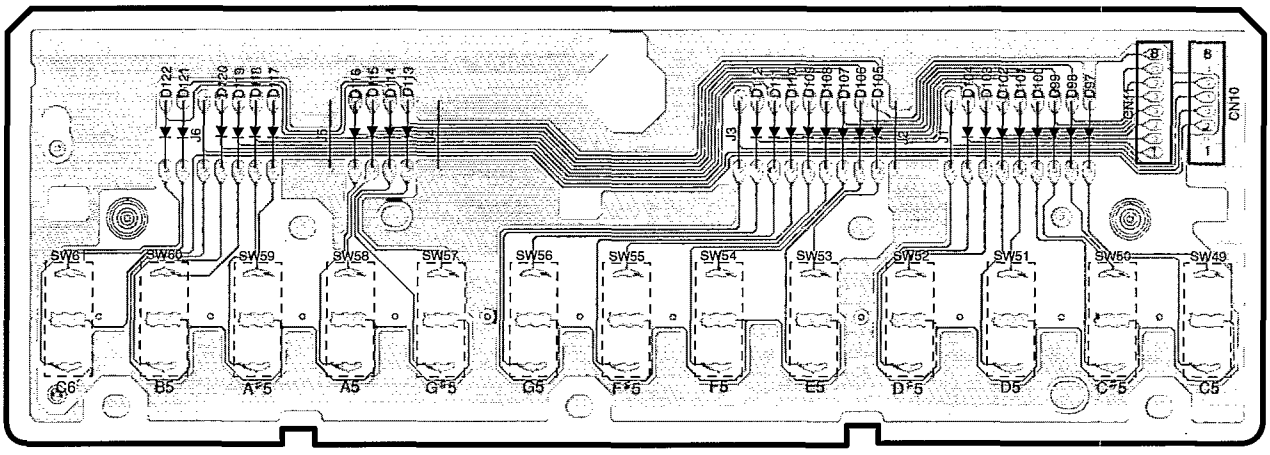
H MKB1 P.C.B.

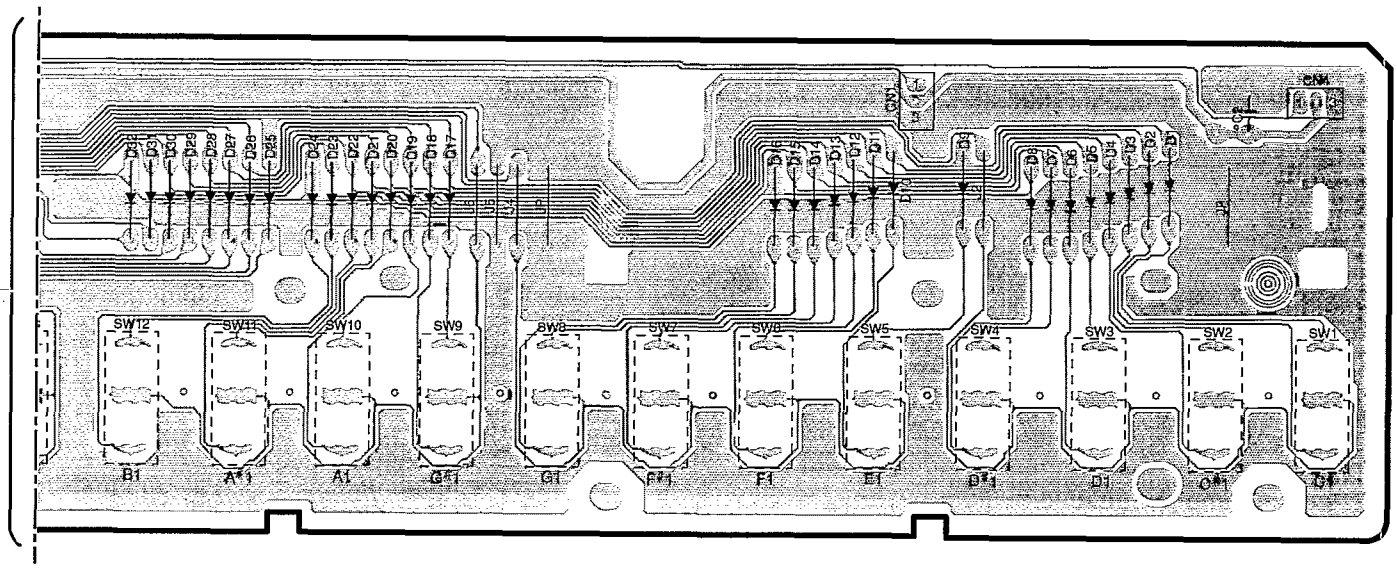


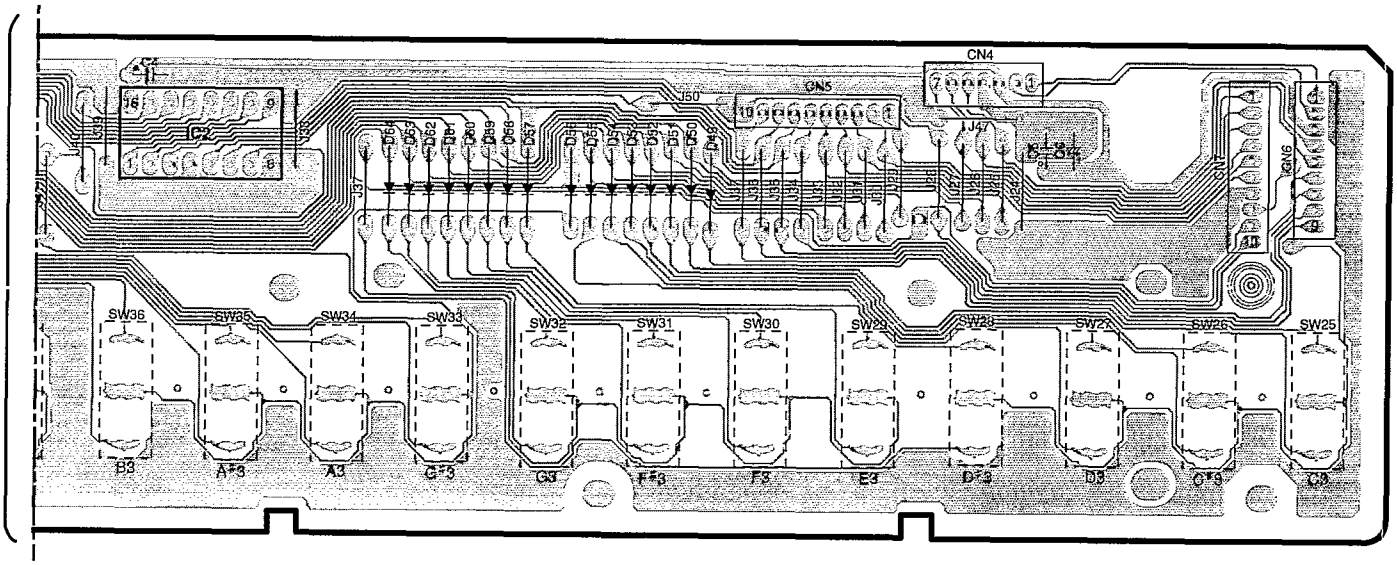
I MKB2 P.C.B.



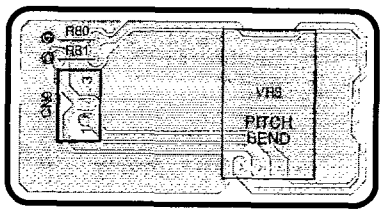
J MKB3 P.C.B.



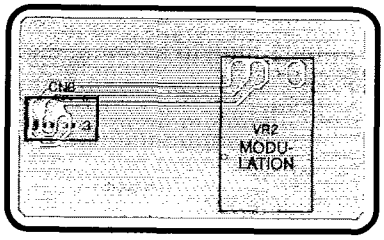




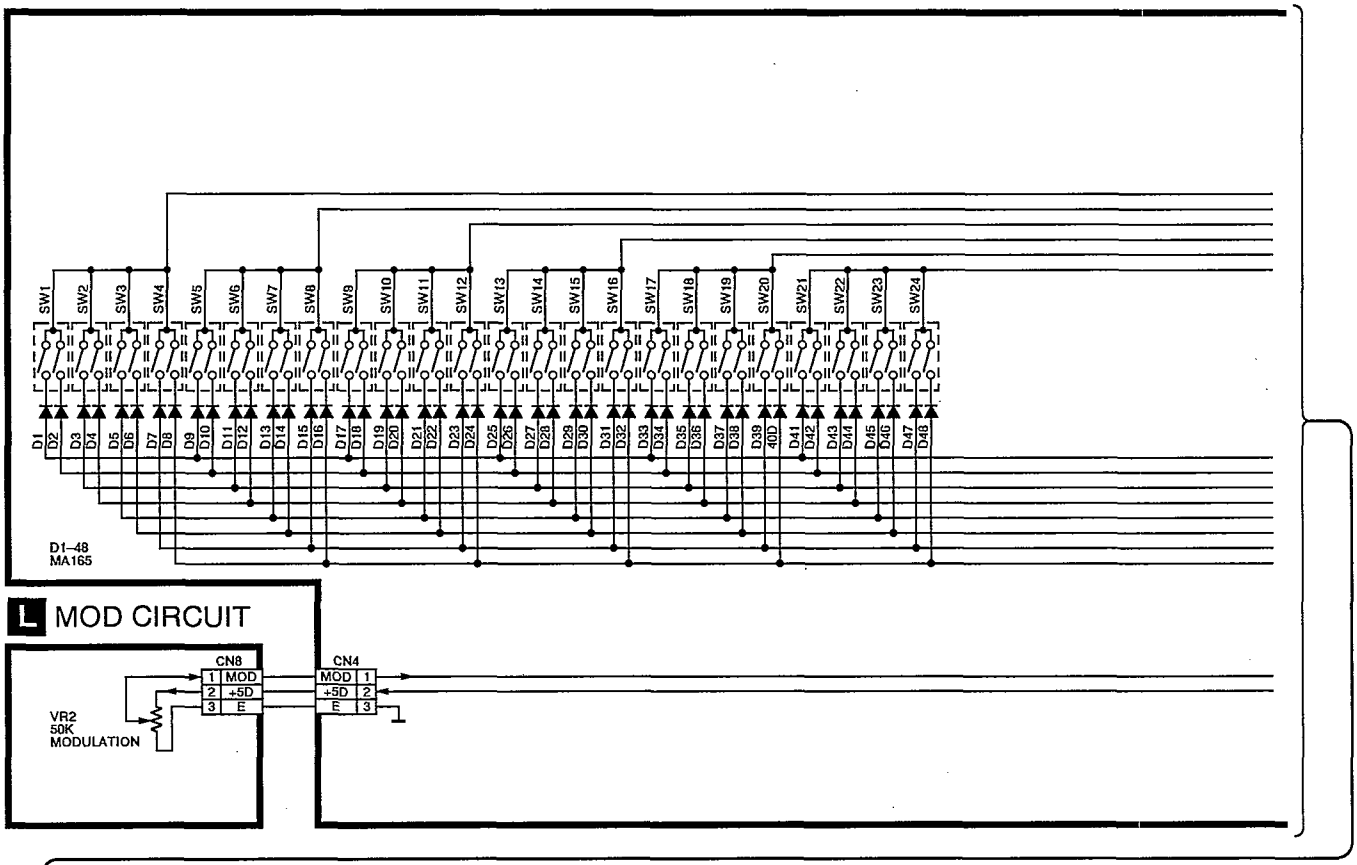
K BEND P.C.B.



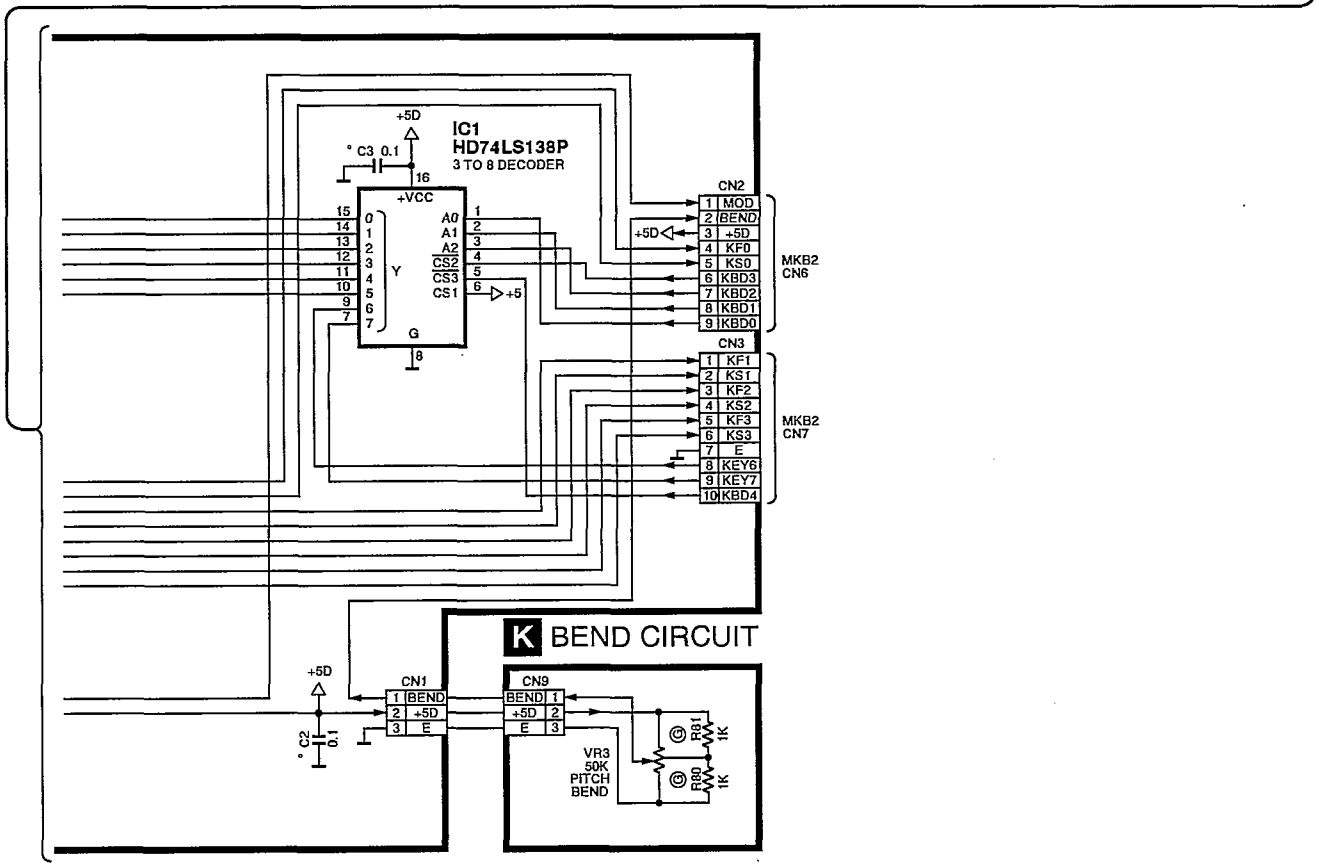
L MOD P.C.B.



H MKB1 CIRCUIT

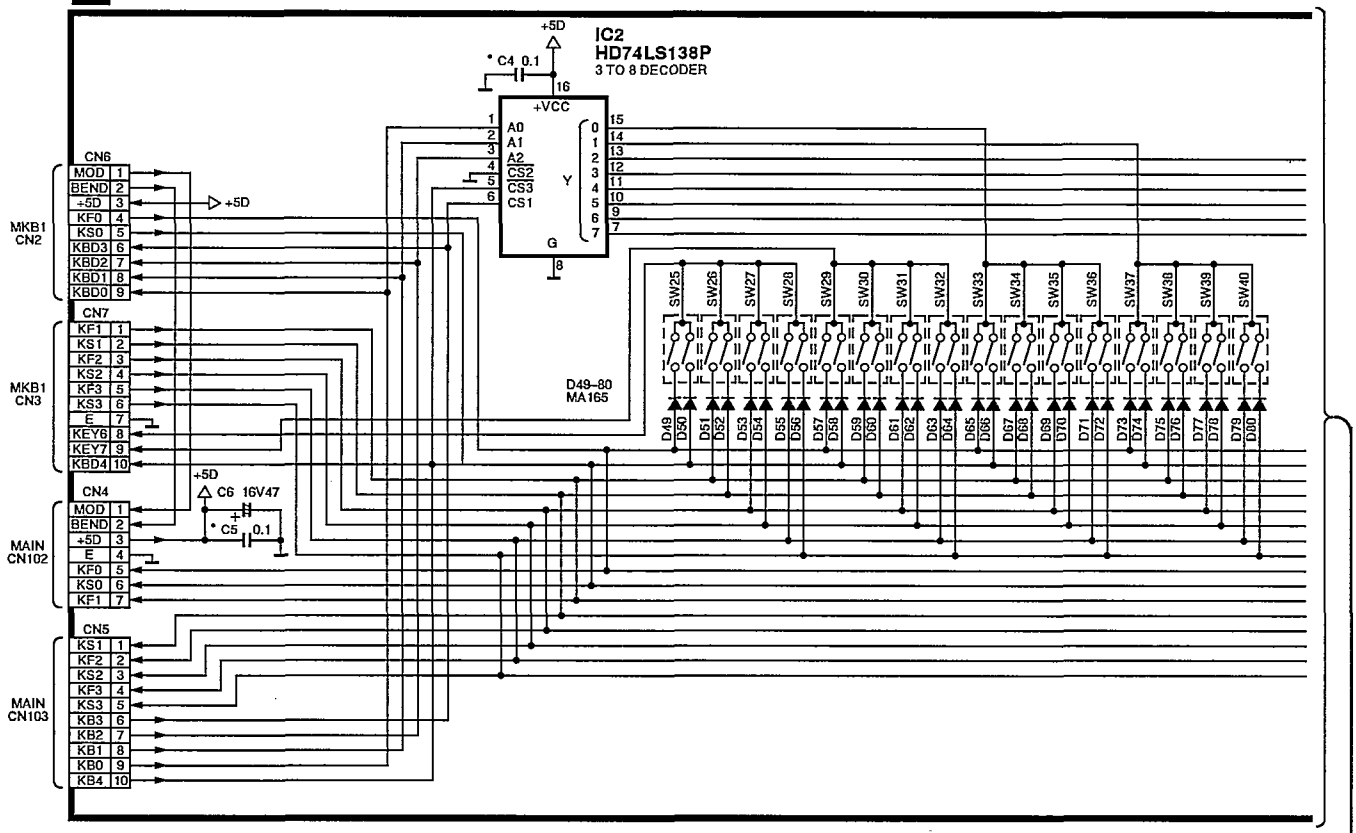


L MOD CIRCUIT

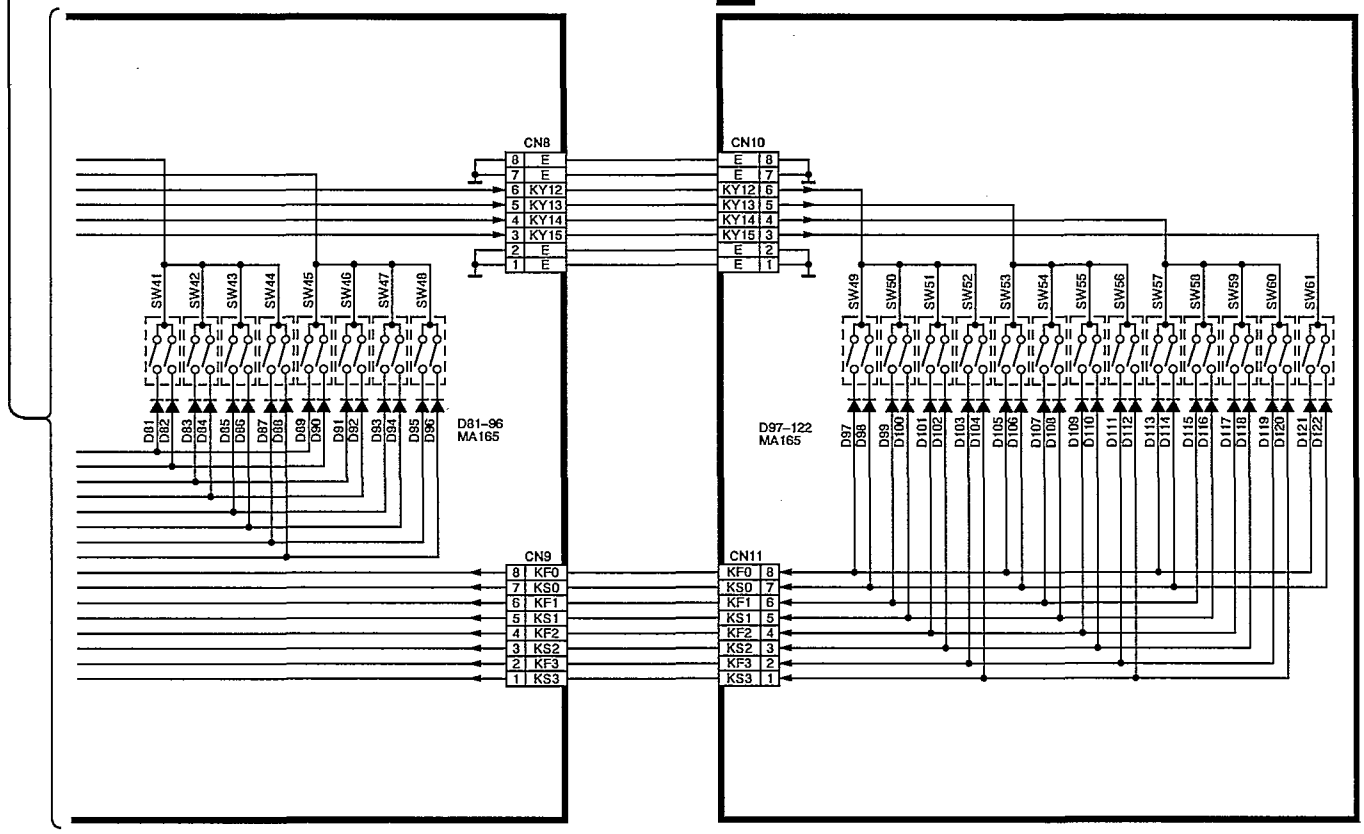


K BEND CIRCUIT

I MKB2 CIRCUIT



J MKB3 CIRCUIT



REPLACEMENT PARTS LIST.....P.C.B. and Wiring Parts

Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retension period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. ○ mark are new parts.
5. For part No. with area mark, check the area when placing an order.

■PRINTED CIRCUIT BOARD

	RTL	Area	Part No.	Description	P/S
○	RTL	EN MC EZ EK EW EF EA EP EH X XL XR XS XD XT XP XW	SXPG230141	MAIN	1
○	RTL	M XM	SXPG230151	MAIN	1
○	RTL		SXPG230321	FAJ	1
○	RTL	EN EZ EK EW EF EA EP EH XL XR XP XW	SXPG230611	ACP	1
○	RTL	M MC XM	SXPG230621	ACP	1
○	RTL	X XS XD XT	SXPG230631	ACP	1
○	RTL		SXPG230221A	CPC	1
○	RTL		SXPG230221B	CPL	1
○	RTL		SXPG230211C	CPR	1
○	RTL		SXPG230211F	LCDCN	1
	RTL		SXPG224831A	MKB1	1
	RTL		SXPG224811B	MKB2	1
	RTL		SXPG220011	MKB3	1
○	RTL		SXPG230211D	BEND	1
○	RTL		SXPG230221E	MOD	1
	RTL		EDMMR63B0F	LCD	1

MAIN MAIN CIRCUIT

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUITS			
○ IC1	MN1382RTX	RESET IC	1
○ IC2	QVIGFKN16AX1	8M BIT FLASH ROM W/PROGRAM DISK	1
IC3	TC7W14F	INVERTER	1
○ IC4	QVIGFKN16AX1	8M BIT FLASH ROM W/PROGRAM DISK	1
○ IC5	QSIGX3C08003	8M BIT MASK ROM	1
IC6	TMP94C241AF	MAIN CPU	1
○ IC7	QSIGX3C08002	8M BIT MASK ROM	1
IC8	BR93LC56RFE2	1K BIT PROGRAMMED EEP ROM	1
IC9	TC74VHC08F	QUAD 2 INPUT AND GATE	1
IC10	TC7SH08F	2 INPUT AND GATE	1
IC11	M5M44265CJ6S	4M BIT DYNAMIC RAM	1
IC12	TC74VHC138F	3 TO 8 DECODER	1
IC13	M5M44265CJ6S	4M BIT DYNAMIC RAM	1
○ IC14	QSIGX3C16004	16M BIT RHYTHM DATA ROM	1
IC15	D72070GF3BE	IC, 8BIT MICROCONTROLLER	1
IC16	M66271FP	LCD CONTROLER	1
IC17	BA10393F	COMPARATOR	1
IC18	TC7SU04F	INVERTER	1
○ IC19	T74VHC74FTL	DUAL D-TYPE FLIP FLOP	1
IC20	TC7S08F	IC, CMOS LOGIC	1
IC101	M5223FPE1	OPERATIONAL AMPLIFIER	1
IC102	TC7W74F	INVERTER	1

Ref. No.	Part No.	Description	P/S
IC103	TC203C220004	TONE GENERATOR LSI	1
○ IC104	QSIGX3C24002	16M BIT WAVEFORM ROM	1
○ IC105	QSIGX3C24001	16M BIT WAVEFORM ROM	1
IC108	M5M44265CJ6S	4M BIT DYNAMIC RAM	1
IC109	TMS57070FFT	DIGITAL SIGNAL PROCESSOR	1
IC110	TC7SU04F	INVERTER	1
IC111	M5218AFP	OPERATIONAL AMPLIFIER	1
○ IC112	PCM69BU-T1	D/A CONVERTER	1
IC113	M5M34051FP	BUS TRANSCEIVER	1
IC114	T7WU04F	TRIPLE INVERTER	1
TRANSISTORS			
Q1	2SD601AQ	TRANSISTOR	1
Q3, 4	2SB709AR	TRANSISTOR	2
Q5	2SD601AQ	TRANSISTOR	1
Q6	2SB709AR	TRANSISTOR	1
Q7	2SD601AQ	TRANSISTOR	1
Q8	2SB952A	TRANSISTOR	1
S Q9	2SC1815GR	TRANSISTOR	1
Q10, 11	2SD601AQ	TRANSISTOR	2
Q101, 102	2SD592ARS	TRANSISTOR	2
DIODES			
D2	MA110	DIODE	1
D3	MA8030L	ZENER, 2.9V	1
D4	MA110	DIODE	1
D5	MA151WK	DIODE	1
D6	MA110	DIODE	1
D7	MA8082M	ZENER, 8.2V	1
D9	MA8051L	ZENER, 5.1V	1
D10~12	MA110	DIODE	3
D13	SFPB-74	DIODE, SI	1
D14	MA110	DIODE	1
○ D15	MA1270HTR	ZENER	1
D16, 17	MA110	DIODE	2
D18	MA2062LF	ZENER, 6.2V	1
○ D19 ⚠	MA8240MTX	ZENER, 24V	1
D20	MA110	DIODE	1
D101	MA8056	ZENER, 5.6V	1
D102	MA1062M	ZENER, 6.2V	1
D103	MA110	DIODE	1
D104	MA151WK	DIODE	1
D105	MA110	DIODE	1
D106	MA151WK	DIODE	1
D107, 109, 111	MA110	DIODE	3

Ref. No.	Part No.	Description	P/S
OSCILLATORS			
X1	QSXG1A1000A	10MHz, CRYSTAL OSCILLATOR	1
X3	QSXG2F2400A	24MHz, CERAMIC OSCILLATOR	1
X101	QSXG1I3386A	33.8688MHZ, CRYSTAL OSCILLATOR	1
X102	QSXG1A2500A	25MHz, QUARTZ OSCILLATOR	1
X103	QSXG2F0100DA	1MHz, CERAMIC OSCILLATOR	1
COMPONENT COMBINATIONS			
Z1	EXBV8V101J	100Ω×4	1
Z2	EXBV8V221J	220Ω×4	1
Z3	EXBS8V472J	4.7kΩ×4	1
Z4, 6~12	EXBV8V470J	47Ω×4	8
Z13	EXBS8V103J	10KΩ×4	1
Z14~20	EXBV8V103J	10KΩ×4	7
Z21	EXBS8V102J	1KΩ×4	1
Z22	EXBV8V221J	220Ω×4	1
Z23, 24	EXBS8V101J	100Ω×4	2
Z25	EXBS8V470J	47Ω×4	1
Z26	EXBV8V470J	47Ω×4	1
Z27	EXBS8V470J	47Ω×4	1
Z101	EXBS8V223J	22KΩ×4	1
Z102	EXBS8V223J	22KΩ×4	1
Z103~112	EXBV8V102J	1KΩ×4	10
Z113~116	EXBS8V101J	100Ω×4	4
Z117	EXBV8V101J	100Ω×4	1
COILS			
R86	BK2125LM152B	HIGH LOSS INDUCTOR	1
L2	QLQGT1T121SA	120μH	1
L101~103	BK2125LM152B	HIGH LOSS INDUCTOR	3
IC PROTECTOR			
IP1 ⚠	ICP-N10T104	IC PROTECTOR	1
RESISTORS			
JR2, 3, 8, 10, 11, 14, 102, 103, 107~109, 111, 113	ERJ6GEY0R00V	0Ω	13
R1, 3, 4	ERJ6GEYJ472V	4.7kΩ	3
R5	ERJ6GEYJ103V	10kΩ	1
R6	ERJ6GEYJ472V	4.7kΩ	1
R7	ERJ6GEYJ103V	10kΩ	1
R8	ERJ6GEYJ102V	1kΩ	1
R9	ERJ6GEYJ104V	100kΩ	1
R11	ERJ6GEYJ472V	4.7kΩ	1
R12	ERJ6GEYJ101V	100Ω	1
R13	ERJ6GEYJ102V	1kΩ	1
R15	ERJ6GEYJ472V	4.7kΩ	1
R16	ERJ6GEYJ101V	100Ω	1
R17	ERJ6GEYJ102V	1kΩ	1
R18	ERJ6GEYJ472V	4.7kΩ	1
R19	ERJ6GEYJ221V	220Ω	1
R20	ERJ6GEYJ102V	1kΩ	1
R21	ERJ6GEYJ222V	2.2kΩ	1
R22	ERJ6GEYJ102V	1kΩ	1
R23	ERJ6GEYJ472V	4.7kΩ	1
R24	ERJ6GEY0R00V	0Ω	1
R25	ERJ6GEYJ104V	100kΩ	1
R26, 27	ERJ6GEYJ101V	100Ω	2

Ref. No.	Part No.	Description	P/S
R28	ERJ6GEYJ102V	1kΩ	1
R30	ERJ6GEYJ472V	4.7kΩ	1
R31	ERJ6GEYJ101V	100Ω	1
R32	ERJ6GEY0R00V	0Ω	1
R33	ERJ6GEY0R00V	0Ω, EN MC EZ EK EW EF EA EP EH X XL XR XS XD XT XP XW	1
R35	ERJ6GEY0R00V	0Ω	1
R36	ERJ6GEYJ105V	1MΩ	1
R38	ERJ6GEYJ470V	47Ω	1
R39	ERJ6GEYJ472V	4.7kΩ	1
R40	ERJ6GEY0R00V	0Ω	1
R42	ERJ6GEYJ102V	1kΩ	1
R43	ERJ6GEYJ472V	4.7kΩ	1
R44	ERJ6GEYJ101V	100Ω	1
R46	ERJ6GEYJ470V	47Ω	1
R47	ERJ6GEYJ472V	4.7kΩ	1
R48	ERJ6GEYJ103V	10kΩ	1
R49, 50	ERJ6GEYJ472V	4.7kΩ	2
○ R55 ⚠	ERD2FCVG470T	47Ω, 1/4W, FUSE TYPE	1
R56	ERJ6GEYJ101V	100Ω	1
R57, 58	ERJ6GEYJ471V	470Ω	2
R59	ERJ6GEY0R00V	0Ω	1
R60	ERJ6GEYJ153V	15kΩ	1
R61, 62	ERJ6GEYJ105V	1MΩ	2
R63	ERJ6GEYJ682V	6.8kΩ	1
R64	ERJ6GEYJ102V	1kΩ	1
R65	ERJ6GEYJ333V	33kΩ	1
R66	ERJ6GEYJ470V	47Ω	1
○ R67 ⚠	ERG1SJ471E	470Ω, 1W, FLAME-PROOF	1
R68	ERJ6GEYJ471V	470Ω	1
R69	ERJ6GEYJ473V	47kΩ	1
R70	ERJ6GEYJ471V	470Ω	1
R71	ERJ6GEYJ683V	68kΩ	1
R72	ERJ6GEYJ470V	47Ω	1
R73	ERJ6GEYJ472V	4.7kΩ	1
R74	ERJ6GEYJ101V	100Ω	1
R75	ERJ6GEYJ102V	1kΩ	1
R76~79	ERJ6GEYJ151V	150Ω	4
R80, 81	ERJ6GEYJ153V	15kΩ	2
R82	ERJ6GEYJ474V	470kΩ	1
R83	ERJ6GEYJ221V	220Ω	1
R84	ERJ6GEYJ473V	47kΩ	1
R85	ERJ6GEYJ103V	10kΩ	1
R87	ERJ6GEYJ470V	47Ω	1
R101~103	ERJ6GEYJ102V	1kΩ	3
R104	ERJ6GEY0R00V	0Ω	1
R105	ERJ6GEYJ105V	1MΩ	1
R106	ERJ6GEYJ681V	680Ω	1
R107	ERJ6GEYJ102V	1kΩ	1
R108, 109	ERJ6GEY0R00V	0Ω	2
R110	ERJ6GEYJ151V	150Ω	1
R111, 112	ERJ6GEYJ471V	470Ω	2
R113	ERJ6GEYJ221V	220Ω	1
R114	ERJ6GEYJ101V	100Ω	1
R115	ERJ6GEYJ471V	470Ω	1
R116, 117	ERJ6GEYJ472V	4.7kΩ	2
R119	ERJ6GEYJ105V	1MΩ	1
R120	ERJ6GEYJ471V	470Ω	1
R122	ERJ6GEYJ470V	47Ω	1
R123 ⚠	ERG1SJ101	100Ω, 1W, FLAME-PROOF	1
R124~126	ERJ6GEYJ472V	4.7kΩ	3
R127, 128	ERJ6GEYJ562V	5.6kΩ	2
R129	ERJ6GEYJ105V	1MΩ	1
R130	ERJ6GEYJ472V	4.7kΩ	1
R131	ERJ6GEYJ471V	470Ω	1
R135	ERJ6GEYJ101V	100Ω	1

Ref. No.	Part No.	Description	P/S
CAPACITORS			
R53	ECUV1H100DCN	10pF	1
C1, 2, 4	ECUV1H104ZFX	0.1µF	3
C3	ECUV1H103KBG	0.01µF	1
C5	ECUV1H332KB	0.0033µF	1
C6	ECUV1E473KB	0.047µF	1
C7	ECUV1H104ZFX	0.1µF	1
C8	ECUV1C224KBX	0.22µF	1
C9~14	ECUV1H104ZFX	0.1µF	6
C15	ECUV1H100DCN	10pF	1
C16	ECEA1CKA100	10µF, 16V	1
C17	ECUV1H100DCN	10pF	1
C18	ECUV1H104ZFX	0.1µF	1
C19	ECUV1E473KB	0.047µF	1
C20~30	ECUV1H104ZFX	0.1µF	11
C31	EECS5R5V105	1F, 5.5V, MEMORY BACK-UP	1
C32	ECA1EM101	100µF, 25V	1
C33	ECUV1H101JG	100pF	1
C34~37	ECUV1H104ZFX	0.1µF	4
C38	ECUV1H333KBX	0.033µF	1
C39	ECUV1H223KBX	0.022µF	1
C40	ECUV1H182JX	0.0018µF	1
C41, 42	ECUV1H104ZFX	0.1µF	2
C43	ECUV1H472KBG	0.0047µF	1
C44	ECUV1H333KBX	0.033µF	1
C45	ECUV1H104ZFX	0.1µF	1
C46, 47	ECUV1H100DCN	10pF	2
C48	ECUV1H104ZFX	0.1µF	1
C49	ECEA1CKA100	10µF, 16V	1
C50	ECEA0JKA221	220µF, 6.3V	1
C51	ECUV1H104ZFX	0.1µF	1
C52	ECUV1H103KBG	0.01µF	1
C54, 55	ECUV1H104ZFX	0.1µF	2
C56	ECA0JM102	1000µF, 6.3V	1
C57	ECUV1H104ZFX	0.1µF	1
C58	ECUV1H331JG	330pF	1
C59	ECEA1VKA100	10µF, 35V	1
C60	ECUV1H101JG	100pF	1
C61	ECA1VM470	47µF, 35V	1
C62	ECEA1CKN100	10µF, 16V	1
C63, 64	ECUV1H220JCN	22pF	2
C65~67	ECUV1H104ZFX	0.1µF	3
C68	ECUV1H101JG	100pF	1
C69	ECUV1H103KBG	0.01µF	1
C70	ECQV1H224JM	0.22µF	1
C71	ECQV1H104JM	0.1µF	1
C72	ECEA1HKN010	1µF, 50V	1
C73	ECUV1H103KBG	0.01µF	1
C74~79	ECUV1H101JG	100pF	6
C80	ECUV1H221JG	220pF	1
C81	ECUV1H101JG	100pF	1
C82~90, 93~96, 101~103	ECUV1H104ZFX	0.1µF	16
C104	ECEA0JKA470	47µF, 6.3V	1
C105	ECUV1H104ZFX	0.1µF	1
C106, 107	ECUV1H030CCN	3pF	2
C109~116, 119~122	ECUV1H104ZFX	0.1µF	12
C123, 124	ECUV1H060DCN	6pF	2
C125~127	ECUV1H104ZFX	0.1µF	3
C128	ECRF1H104ZF	0.1µF	1
C129~131	ECUV1H104ZFX	0.1µF	3
C132	ECEA0JKA101	100µF, 6.3V	1
C133	ECEA1CKN100	10µF, 16V	1
C134~137	ECUV1H104ZFX	0.1µF	4
C138	ECUV1H471JG	470pF	1
C139	ECUV1H101JG	100pF	1
C140	ECUV1H471JG	470pF	1
C141	ECUV1H104ZFX	0.1µF	1
C142	ECUV1H101JG	100pF	1
C143~147	ECUV1H221JG	220pF	5
C148	ECUV1H104ZFX	0.1µF	1
C149, 150	ECUV1H103KBG	0.01µF	2
C151~153, 155~57	ECUV1H104ZFX	0.1µF	6

FAJ FILTER, AMP & JACK CIRCUIT

	Ref. No.	Part No.	Description	P/S
	INTEGRATED CIRCUITS			
	IC1	QCPL-260L	PHOTO COUPLER	1
	IC2~6	M5218AL	OPERATIONAL AMPLIFIER	5
	IC7	TA8233H	POWER AMPLIFIER	1
	TRANSISTORS			
	Q1, 2	2SD592ARS	TRANSISTOR	2
S	Q3	2SA1015-GR	2SA933STRS (SUB. PART)	1
S	Q4	2SC1815GR	TRANSISTOR	1
S	Q5	2SA1015-GR	2SA933STRS (SUB. PART)	1
S	Q6, 7	2SC1815GR	TRANSISTOR	2
S	Q8	2SA1015-GR	2SA933STRS (SUB. PART)	1
S	Q9	2SC1815GR	TRANSISTOR	1
S	Q10	2SA1015-GR	2SA933STRS (SUB. PART)	1
	DIODES			
	D1~3	MA165	DIODE	3
	D4	SVDGERA1502	RECTIFIER	1
	D5	MA165	DIODE	1
	D7, 8	SVDGERA1502	RECTIFIER	2
	D9~12 ⚠	SVDS3V20	RECTIFIER	4
	TRANSFORMER			
	T1 ⚠	QTDG003A	TRANSFORMER	1
	COILS			
	L1	QLQGT3T131TA	130µH×3	1
	L2	QLQGT1B101KA	100µH	1
	L3~7	QLQGT3T131TA	130µH×3	5
	L8	QLQGT2T100SA	10µH×2	1
	L9~11	QLQGT3T131TA	130µH×3	3
	JACKS			
	JK1	QJSG017AA	COMPUTER	1
○	JK2	QJSG020AA	MIDI OUT	1
○	JK3	QJSG020AA	MIDI IN	1
	JK4	QJJG010AA	EXP PEDAL	1
○	JK5	QJJG012AA	FOOT SW	1
○	JK8	QJJG012AA	AUX IN L	1
○	JK9	QJJG012AA	AUX IN R	1
○	JK10	QJJG012AA	LINEOUT L	1
○	JK11	QJJG012AA	LINEOUT R	1
	JK12	QJJG010AA	COMPUTER	1

Ref. No.	Part No.	Description	P/S
SWITCH			
S1	QSSGT010AA	SLIDE SWITCH	1
RESISTORS			
R2 ⚠	ERQ2CJP2R0S	2Ω, 2W, FUSE TYPE	1
R4, 5	ERDS2TJ682	6.8kΩ	2
R6	ERDS2TJ102	1kΩ	1
R7	ERDS2TJ330	33Ω	1
R8	ERDS2TJ104	100kΩ	1
R9	ERDS2TJ680	68Ω	1
R10	ERDS2TJ221	220Ω	1
R11	ERDS2TJ103	10kΩ	1
R12	ERDS2TJ224	220kΩ	1
R13	ERDS2TJ103	10kΩ	1
R14	ERDS2TJ102	1kΩ	1
R15	ERDS2TJ224	220kΩ	1
R17	ERDS2TJ102	1kΩ	1
R19	ERDS2TJ223	22kΩ	1
R22	ERDS2TJ223	22kΩ	1
R23	ERDS2TJ102	1kΩ	1
R25	ERDS2TJ104	100kΩ	1
R26	ERDS2TJ103	10kΩ	1
R27	ERDS2TJ823	82kΩ	1
R28, 30	ERDS2TJ682	6.8kΩ	2
R31	ERDS2TJ104	100kΩ	1
R32	ERDS2TJ103	10kΩ	1
R33	ERDS2TJ823	82kΩ	1
R34	ERDS2TJ682	6.8kΩ	1
R35	ERDS2TJ223	22kΩ	1
R36	ERDS2TJ333	33kΩ	1
R37	ERDS2TJ223	22kΩ	1
R38	ERDS2TJ333	33kΩ	1
R40	ERDS2TJ682	6.8kΩ	1
R41	ERDS2TJ333	33kΩ	1
R42	ERDS2TJ333	33kΩ	1
R43	ERDS2TJ153	15kΩ	1
R45, 46	ERDS2TJ102	1kΩ	2
R47	ERDS2TJ103	10kΩ	1
R48	ERDS2TJ153	15kΩ	1
R49, 50	ERDS2TJ182	1.8kΩ	2
R51	ERDS2TJ563	56kΩ	1
R52	ERDS2TJ154	150kΩ	1
R53	ERDS2TJ683	68kΩ	1
R54~56	ERDS2TJ222	2.2kΩ	3
R57	ERDS2TJ102	1kΩ	1
R58	ERDS2TJ103	10kΩ	1
R59	ERDS2TJ471	470Ω	1
R60	ERDS2TJ220	22Ω	1
R61	ERDS2TJ154	150kΩ	1
R62	ERDS2TJ471	470Ω	1
R63 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, FUSE TYPE	1
R64	ERDS2TJ563	56kΩ	1
R65	ERDS2TJ683	68kΩ	1
R66	ERDS2TJ102	1kΩ	1
R67	ERDS2TJ220	22Ω	1
R70	ERDS2TJ102	1kΩ	1
R71, 73, 75, 76 ⚠	ERD25FVJ2R2	2.2Ω, 1/4W, FLAME-PLOOF	4
R78	ERG1SJ221	220Ω, 1W	1
R79	ERDS2TJ822	8.2kΩ	1
R80	ERG1SJ221	220Ω, 1W	1
R81	ERDS2TJ822	8.2kΩ	1
R82, 83	ERDS2TJ681	680Ω	2
R84, 85 ⚠	ERG1SJ100	10Ω, 1W, FLAME-PROOF	2
R86, 87	ERDS2TJ103	10kΩ	2

Ref. No.	Part No.	Description	P/S
CAPACITORS			
S C1 ⚠	ECCD3F180JGE	18pF	1
C2	ECEA0JKA101	100μF, 6.3V	1
C3	ECQB1H473JF	0.047μF	1
C4	QCBG1H104ZFA	0.1μF	1
C5	ECCR1H221J	220pF	1
C6, 7	QCBG1H104ZFA	0.1μF	2
C8	ECQV1H683JM	0.068μF	1
C9	ECQB1H223JF	0.022μF	1
C10	ECQV1H683JM	0.068μF	1
C11	ECQB1H223JF	0.022μF	1
C12~14	QCBG1H104ZFA	0.1μF	3
C15	ECQB1H103JF	0.01μF	1
C16	QCBG1H104ZFA	0.1μF	1
C17	ECQB1H153JF	0.015μF	1
C18, 19	ECEA1HKN010	1μF, 50V	2
C20	ECQB1H103JF	0.01μF	1
C21, 22	QCBG1H104ZFA	0.1μF	2
C23	ECQB1H153JF	0.015μF	1
C24	ECQG1H222KZ	0.0022μF	1
C25	ECQG1H472KZ	0.0047μF	1
C26	ECQG1H152KZ	0.0015μF	1
C27	ECQG1H222KZ	0.0022μF	1
C28	ECQG1H472KZ	0.0047μF	1
C29	ECQG1H152KZ	0.0015μF	1
C30	ECEA1HKA010	1μF, 50V	1
C31	ECCR1H101J	100pF	1
C32	ECEA1HKA010	1μF, 50V	1
C33	ECCR1H101J	100pF	1
C34	ECA1CM102	1000μF, 16V	1
C35	QCBG1H104ZFA	0.1μF	1
C36, 37	ECEA1HKA010	1μF, 50V	2
○ C38	ECA1CM221B	220μF, 16V	1
C39	ECCR1H470J	47pF	1
C40, 41	ECQG1H102KZ	0.001μF	2
C42	ECA1EM470	47μF, 25V	1
C43	ECEA1CKA100	10μF, 16V	1
C44	ECA1EM101	100μF, 25V	1
C45	ECEA1CKA100	10μF, 16V	1
○ C46	ECA1CM221B	220μF, 16V	1
C47	ECCR1H470J	47pF	1
C48	ECQV1H104JM	0.1μF	1
C49	ECEA1CKN100	10μF, 16V	1
○ C50, 51	ECA1CM221B	220μF, 16V	2
C52, 53	ECQV1H104JM	0.1μF	2
C54	ECEA1CKN100	10μF, 16V	1
C55	ECQV1H104JM	0.1μF	1
C57, 58	ECA1EM682E	6800μF, 25V	2
C59~64	ECQG1H222KZ	0.0022μF	6
C65, 66	ECEA50Y1	1μF, 50V	2
C67 ⚠	ECQE1A104M6	0.1μF, 125V	1
C68~72, 74	QCBG1H104ZFA	0.1μF	6

ACP AC POWER SUPPLY CIRCUIT

	Ref. No.		Part No.	Description	P/S
			LINE FILTER		
	L1	⚠	SLTGLF3	LINE FILTER	1
			JACK		
	JK1	⚠	SJVD0203B	AC INLET	1
			SWITCH		
	S1	⚠	SSRG100A	VOLTAGE SELECTOR, X XS XD XT	1
			FUSES		
○	F1	⚠	XBA1C16NB100	1.6A 125V, M MC XM	1
○	F1	⚠	XBA2C10TB0L	T1AL 250V, X XS XD XT	1
○	F2	⚠	XBA2C05TB0L	T500mAL, 250V, X XS XD XT	1
○	F3	⚠	XBA2C05TB0L	T500mAL, 250V, EN EK EZ XW EW EF EA EH EP XL XP XR X XS XD XT	1
			CAPACITORS		
	C1	⚠	ECKCVA1472MF	4700pF, LINE CAPACITOR	1
	C2	⚠	ECQU2A104MN	0.1μF, 250V, ACROSS-THE LINE CAPACITOR	1

CPC CONTROL PANEL CENTER CIRCUIT

Ref. No.	Part No.	Description	P/S
	INTEGRATED CIRCUITS		
IC1	M37471M2196S	8 BIT MICROCOMPUTER	1
IC2, 3	HD74LS07P	HEX BUFFERS	2
IC4	M37471M2196S	8 BIT MICROCOMPUTER	1
IC5	HD74LS07P	HEX BUFFERS	1
	TRANSISTORS		
Q1~10	2SA830SB	TRANSISTOR	10
	DIODES		
D1~5, 9~31, 33~39, 41~63, 201~205, 209~232, 234~236, 239, 240	MA165	DIODE	92
D101~105, 109~119, 121, 122, 125~131, 133~135, 139, 304, 305, 309~314, 317~322, 325~327, 334~336	SEL4117RM	LED(RED)	49
D120, 136~138, 301~303, 328, 329, 437	SEL4417GM	LED(GREEN)	10
	OSCILLATORS		
X1, 2	EF0EC4004A3	4MHz, CERAMIC OSCILLATOR	2
	SWITCHES		
S1~5, 9~31, 33~39, 41~63, 201~205, 209~232, 234~236, 239, 240	EVQ21507K	PUSH SWITCH	92
S401	QSRGT002AA	ENCODER SWITCH	1
	RESISTORS		
R1~4	ERDS2T0	0Ω, 1/4W	4
R5, 6	ERDS2TJ101	100Ω	2
R7	ERDS2TJ103	10kΩ	1
R8	ERDS2TJ333	33kΩ	1
R9	ERDS2TJ103	10kΩ	1
R10	ERDS2T0	0Ω, 1/4W	1
R11~23	ERDS2TJ103	10kΩ	13
R24~35	ERDS2TJ680	68Ω	12
R36	ERDS2TJ472	4.7kΩ	1
R37	ERDS2TJ472	4.7kΩ	1
R38	ERDS2TJ473	47kΩ	1
R39	ERDS2TJ473	47kΩ	1
R40	ERDS2TJ102	1kΩ	1
R41~44	ERDS2T0	0Ω, 1/4W	4
R45, 46	ERDS2TJ101	100Ω	2
R47, 48	ERDS2TJ103	10kΩ	2
R49	ERDS2TJ333	33kΩ	1
R50	ERDS2T0	0Ω, 1/4W	1
R51~63	ERDS2TJ103	10kΩ	13
R64~69	ERDS2TJ680	68Ω	6
	CAPACITORS		
C1	ECEA0JKA221	220μF, 6.3V	1
C2	ECEA0JKA470	47μF, 6.3V	1
C3~6	QCBG1H104ZFA	0.1μF	4
C8	ECEA0JKA221	220μF, 6.3V	1
C9, 10	ECBA1H102KB	0.001μF	2
C11	QCBG1H104ZFA	0.1μF	1
C12	ECEA0JKA470	47μF, 6.3V	1
C13~15	QCBG1H104ZFA	0.1μF	3

CPL CONTROL PANEL LEFT CIRCUIT

Ref. No.	Part No.	Description	P/S
DIODES			
D206, 241~245, 249~254	MA165	DIODE	12
D330	SEL4417GM	LED (GREEN)	1
D333, 338	SEL4117RM	LED (RED)	2
SWITCHES			
S206, 241~245, 249~254	EVQ21507K	PUSH SWITCH	12
VARIABLE RESISTOR			
VR1	EVD07205B24G	20kΩ B, MAIN VOLUME	1
CAPACITOR			
C7	QCBG1H104ZFA	0.1μF	1

CPR CONTROL PANEL RIGHT CIRCUIT

Ref. No.	Part No.	Description	P/S
DIODES			
D65~68, 73~76, 81~83, 89~92	MA165	DIODE	15
D149~159, 161, 162	SEL4417GM	LED (GREEN)	13
D163	SEL4117RM	LED (RED)	1
SWITCHES			
S65~68, 73~76, 81~83, 89~92	EVQ21507K	PUSH SWITCH	15

MKB1 MANUAL KEYBOARD 1 CIRCUIT

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUIT			
IC1	HD74LS138P	3 TO 8 DECODER	1
DIODES			
D1~48	MA165	DIODE	48
CAPACITORS			
C2, 3	ECRF1H104ZF	0.1μF	2

MKB2 MANUAL KEYBOARD 2 CIRCUIT

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUIT			
IC2	HD74LS138P	3 TO 8 DECODER	1
DIODES			
D49~96	MA165	DIODE	48
CAPACITORS			
C4, 5	ECRF1H104ZF	0.1μF	2
C6	ECEA1CKA470	47μF, 16V	1

MKB3 MANUAL KEYBOARD 3 CIRCUIT

Ref. No.	Part No.	Description	P/S
DIODES			
D97~122	MA165	DIODE	26

BEND PITCH BEND CIRCUIT

Ref. No.	Part No.	Description	P/S
VARIABLE RESISTOR			
VR3	QRVG16A02B54	50kΩ, B	1
RESISTORS			
R80, 81	ER0S2CKF1001	1kΩ, ±1%	2

MOD MODULATION CIRCUIT

Ref. No.	Part No.	Description	P/S
VARIABLE RESISTOR			
VR2	QRVG16A02B54	50kΩ, B	1

■ WIRING PARTS

Ref. No.	Part No.	Description	P/S
○ W1	QEXGVH06110D	CONNECTOR WITH WIRE	1
W2	QEXGSS12045B	CONNECTOR WITH WIRE	1
○ W3	QEXGSS15010B	CONNECTOR WITH WIRE	1
○ W4	QEXGSS14015B	CONNECTOR WITH WIRE	1
○ W5	QEUGS7W15BZ	FLAT CABLE	1
W6	QEUGS8W08BZ	FLAT CABLE	1
W7	QEUGS8W06BZ	FLAT CABLE	1
○ W8	QEUGSAW32BZ	FLAT CABLE	1
○ W9	QEUGS7W32BZ	FLAT CABLE	1
W10	QEUGS9W06BZ	FLAT CABLE	1
W11	QEUGSAW08BZ	FLAT CABLE	1
W12 ⚠	QEXGVH03065B	CONNECTOR WITH WIRE	1
○ W13	QEXGZA34055B	CONNECTOR WITH WIRE	1
W14	QEUGS3W15BZ	FLAT CABLE	1
W15	QEUGS3W07BZ	FLAT CABLE	1

REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retension period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. ○ mark are new parts.
3. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
4. For part No. with area mark, check the area when placing an order.
5. The raw material indication for synthetic resin
   In order to facilitate classification of parts of synthetic resin manufacture and to promote the recycling of natural resources, a raw material symbol for such parts is indicated in the Ref. No./ Material column.

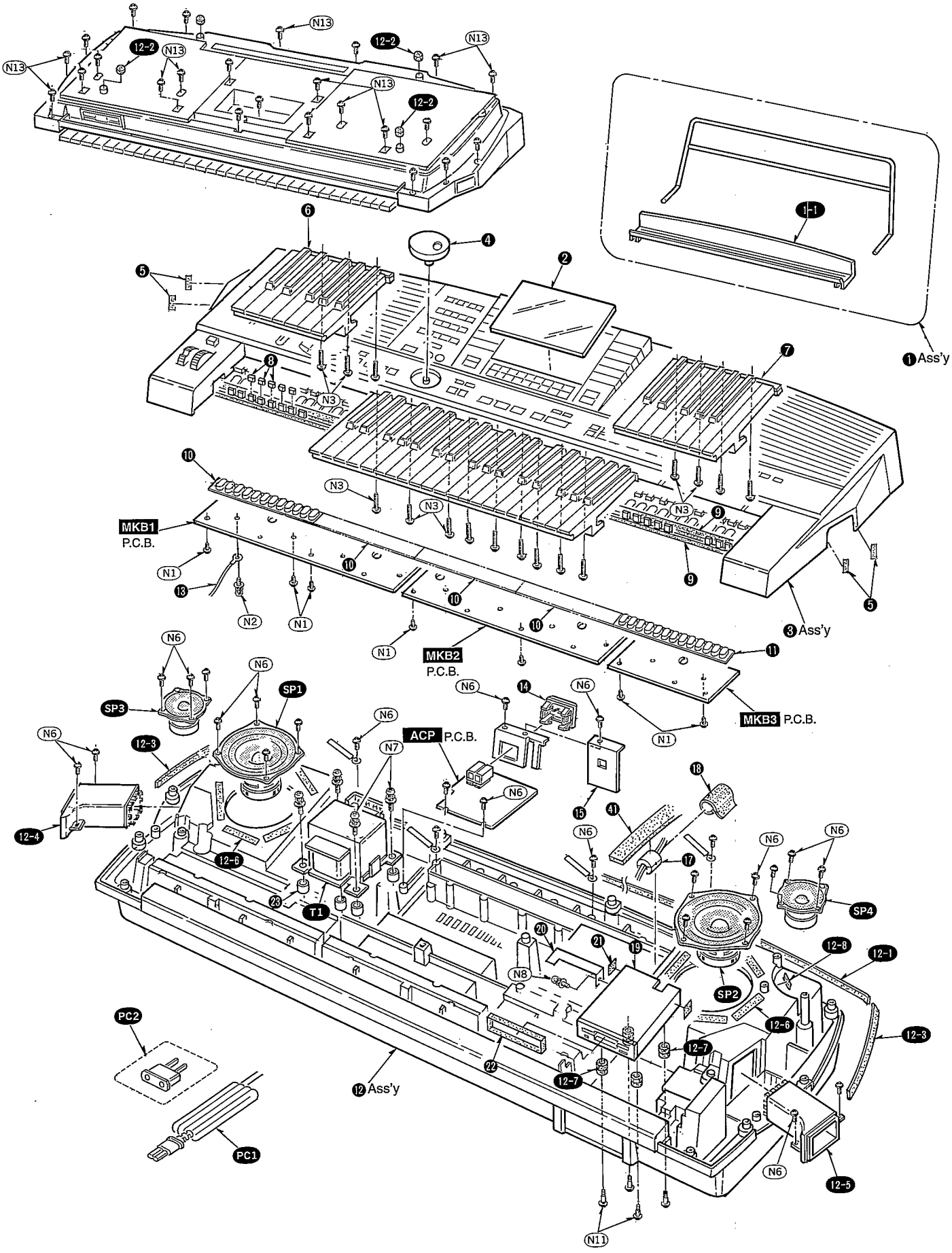
■ CABINET & CHASSIS PARTS

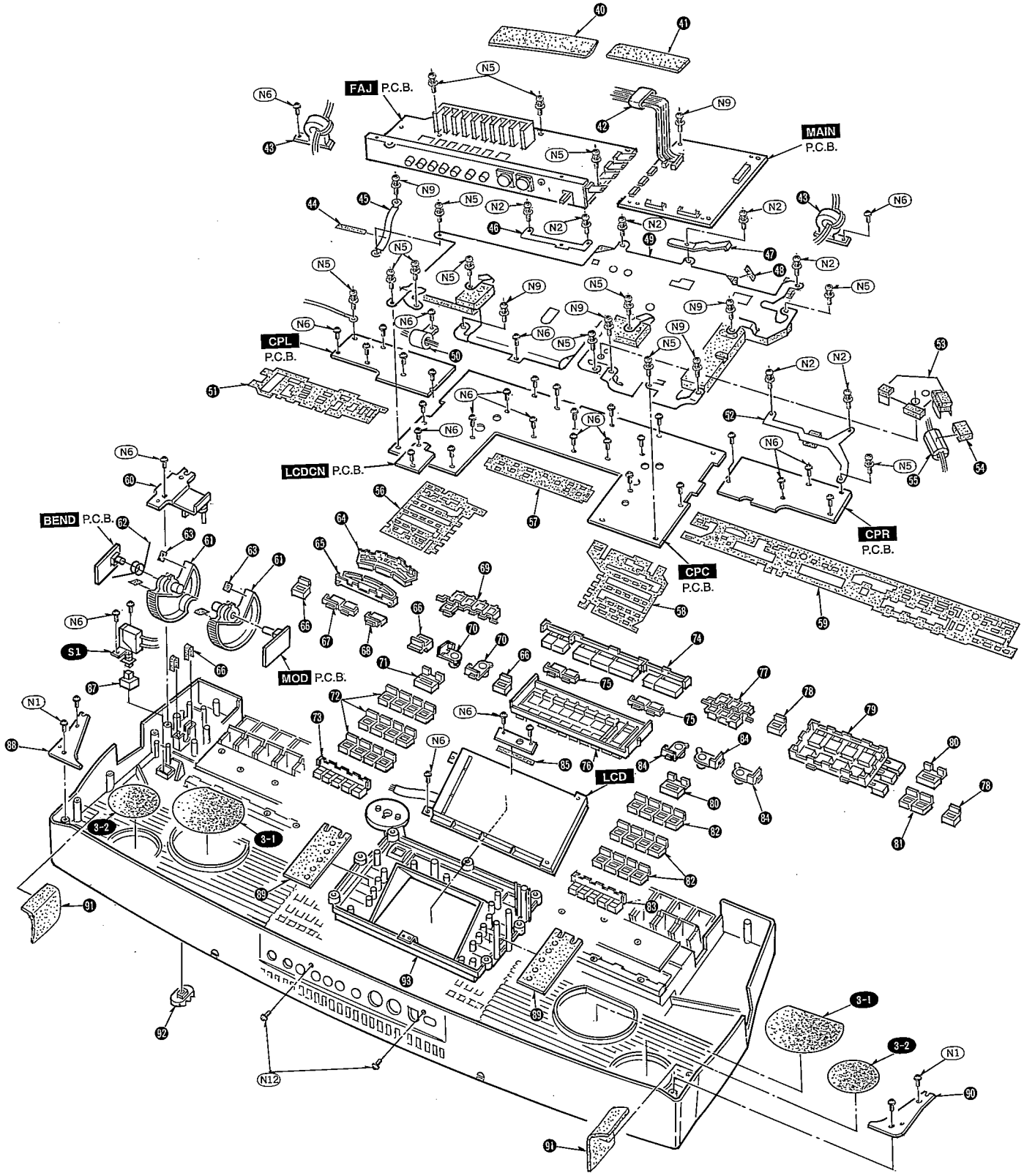
	Ref. No.		Part No.	Description	P/S
			POWER CORD & PLUG		
	PC1	⚠	QJAG027AA	POWER CORD, EN EZ EW EF EA EP EH X XS XT XP XW	1
	PC1	⚠	QJAG025AA	POWER CORD, M MC XM	1
	PC1	⚠	QJAG028AA	POWER CORD, EK XD	1
	PC1	⚠	QJAG029AA	POWER CORD, XL XR	1
	PC2	⚠	SJP5213-1	ATTACHMENT PLUG, X XT XP	1
			SWITCH		
	S1	⚠	ESB823V	POWER SWITCH	1
			SPEAKERS		
○	SP1, 2		QASG12P06A	12cm,4Ω	2
	SP3, 4		QASG65PH03AK	6.5cm,8Ω	2
			TRANSFORMERS		
	T1	⚠	QTPG1M028A	POWER TRANSFORMER, M MC XM	1
	T1	⚠	QTPG1M029B	POWER TRANSFORMER, EN EZ EK EW EF EA EP EH XL XR XP XW	1
	T1	⚠	QTPG1M030B	POWER TRANSFORMER, XL XS XD XT	1
			CABINET PARTS		
	1		QYAG3004AAK	MUSIC STAND ASS'Y	1
	1-1	PS	QMRG7065AAK	TABLE OF MUSIC BOOK	1
○	2		QKWG032AA	LCD PANEL	1
○	3	PS	QYPG1077ABK	CONTROL PANEL	1
○	3-1		QMFG4212AAK	SPEAKER NET	2
○	3-2		QMFG4213AAK	SPEAKER NET	2
	4	ABS	QGUG3002BB	DIAL WHEEL	1
○	5		QMFG4110AAK	CUSHION	4
	6	ABS	QMWG9020AAK	12 KEYS	4
	7	ABS	QMWG9021AAK	13 KEYS	1
○	8		QMGG055AA	KEY GUIDE	61
	9		QMFG1141AA	FELT	2
	10		QMWG6015CAK	RUBBER SWITCH (12PCS.ON ONE)	4
	11		QMWG6014CAK	RUBBER SWITCH (13PCS.ON ONE)	1
○	12		QYKG192EAK	BOTTOM CABINET, EN EZ EK EW EF EA EP EH X XL XR XS XD XT XP XW	1
○	12-1		QMRG5188AAK	CUSHION	1
	12-2		QMRG7070AAK	FOOT	4
○	12-3		QMFG4223AAK	CUSHION	2
	12-4	PS	QMRG7078ABK	SOUND PORT,LEFT	1
	12-5	PS	QMRG7079ABK	SOUND PORT,RIGHT	1
	12-6		QMRG5099AAK	CUSHION	8
	12-7		QMGG041AA	SPACER	4
	12-8		QMFG4187AAK	CUSHION	2
○	12		QYKG192FAK	BOTTOM CABINET, M MC XM	1
○	12-1		QMRG5188AAK	CUSHION	1
	12-2		QMRG7070AAK	FOOT	4
○	12-3		QMFG4223AAK	CUSHION	2
	12-4	PS	QMRG7078ABK	SOUND PORT,LEFT	1
	12-5	PS	QMRG7079ABK	SOUND PORT,RIGHT	1
	12-6		QMRG5099AAK	CUSHION	8
	12-7		QMGG041AA	SPACER	4
	12-8		QMFG4187AAK	CUSHION	2
	13		QEXGRA01010Q	WIRE	1
	14	⚠ PS	SJS9334A	AC INLET COVER, M MC XM	1
	14	⚠ PS	SJS9231A	AC INLET COVER, EN EZ EK EW EF EA EP EH X XL XR XS XD XT XP XW	1
○	15		QMRG2049AAK	COVER, M MC XM X XS XD XT	1
	17		QLZG020A	CORE, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	1
○	18		QMRG5014AA	CUSHION, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	1
	19		QAUG019AA	DISK DRIVE UNIT	1
○	20		QSCG111A	PLATE	1
	21		QMFG4094AA	CUSHION	2
	22		QMFG4207AA	CUSHION	1
	23		QMRG1020AA	SPACER, EN EZ EK EW EF EA EP EH X XL XR XS XD XT XP XW	4
○	40		QMRG5029AA	CUSHION	1
○	41		QMRG5105AA	CUSHION, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	2

	Ref. No.		Part No.	Description	P/S
○	41		QMRG5105AA	CUSHION, X XS XD XT	1
	42	⚠	QLZG013A	CORE, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	1
○	43		QLZG017AA	CORE, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	2
	44		QMFG4167AAK	CUSHION	1
○	45		QEXGZA01010B	WIRE	1
○	46		QSCG110AK	PLATE	1
○	47		QMCG009AA	SPRING	1
○	48		QMRG5197AA	CUSHION	1
○	49		QSCG105AK	SHIELD	1
	50		QLZG019A	CORE, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	1
○	51		QMFG4218AAK	CUSHION	1
○	52		QSCG109AK	SHIELD	1
○	53		QMRG5195AA	CUSHION, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	1
○	54		QMRG5196AA	CUSHION, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	1
○	55		QLZG022A	CORE, EN M MC XM EZ EK EW EF EA EP EH XL XR XP XW	1
○	56		QMFG4216AAK	CUSHION	1
	57		QMFG4184AAK	CUSHION	1
○	58		QMFG4217AAK	CUSHION	1
○	59		QMFG4219AAK	CUSHION	1
○	60	ABS	QMNG0057AAK	HOLDER	1
	61	ABS	SBNG4050A	WHEEL KNOB	2
	62		QMBG012AAK	SPRING	1
	63		QMFG4076AAK	CUSHION	4
○	64		QGUG1385ABK	BUTTON	1
○	65		QGUG1384ABK	BUTTON	1
	66		QGUG1435AAK	BUTTON	3
○	67		QGUG1456AAK	BUTTON	1
○	68		QGUG1456AB1K	BUTTON	1
○	69		QGUG1441BAK	BUTTON	1
○	70		QGUG1458AAK	BUTTON	2
○	71		QGUG1457AA1K	BUTTON	1
	72		QGUG1438ABK	BUTTON	3
○	73		QGUG1455AA1K	BUTTON	1
○	74		QGUG1454AA1K	BUTTON	1
○	75		QGUG1456AAK	BUTTON	2
	76		QGUG1420AA	BUTTON	1
○	77		QGUG1442ABK	BUTTON	1
	78		QGUG1435AAK	BUTTON	2
○	79		QGUG1453AA1K	BUTTON	1
○	80		QGUG1457AAK	BUTTON	2
	81		QGUG1436AA2K	BUTTON	1
	82		QGUG1438ABK	BUTTON	3
○	83		QGUG1455AAK	BUTTON	1
○	84		QGUG1458AAK	BUTTON	3
○	85		QMRG5191AA	SPACER	1
	86		QMFG4167AAK	CUSHION	2
	87	ABS	QGUG1040AA	BUTTON,POWER SWITCH	1
○	88		QMRG2072AAK	PLATE	1
○	89		QMRG5190AAK	PLATE	2
○	90		QMRG2072AAK	PLATE	1
○	91		QMRG5194AAK	CUSHION	2
	92		SBNG7070B	KNOB,MAIN VOLUME	1
○	93	ABS	QGPG1032ABK	ORNAMENT	1

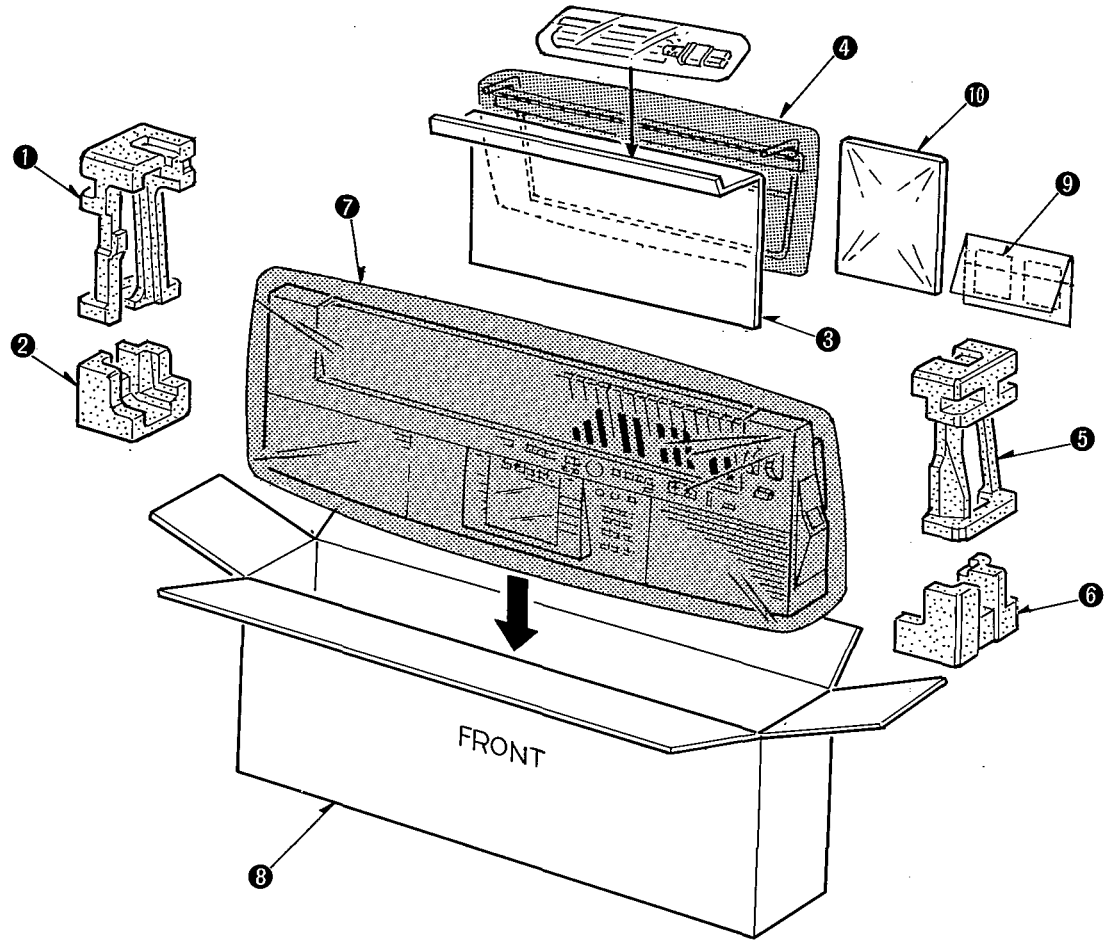
	Ref. No.	Part No.	Description	P/S
	SCREWS			
	N1	XTW3+10QFZ	SCREW	12
○	N2	XYE3+FG10FZ	SCREW WITH WASHER	8
	N3	XTW3+20Q	SCREW	16
○	N5	XYE3+FG12	SCREW WITH WASHER	12
	N6	XTW3+12Q	SCREW	58
	N7	XYN4+F30	SCREW WITH WASHER, EN EZ EK EW EF EA EP EH X XL XR XS XD XT XP XW	4
	N7	XYN4+F25	SCREW WITH WASHER, M MC XM	4
	N8	XYN3+F6	SCREW WITH WASHER	1
○	N9	QHDG052AA	SCREW WITH WASHER	6
	N11	QHDG043AA	SCREW WITH WASHER	4
	N12	XTW3+14TFZ	SCREW	2
	N13	XTW3+20QFZ	SCREW	24

■CABINET PARTS LOCATION




FAJ P.C.B.
MAIN P.C.B.
CPL P.C.B.
LCDCN P.C.B.
BEND P.C.B.
MOD P.C.B.
CPC P.C.B.
CPR P.C.B.
LCD
S1
3-1
3-2

■PACKING



■PACKING PARTS

	Ref. No.		Part No.	Description	P/S
			PACKING PARTS		
○	1	PS	QPNG0683AAK	PAD	1
○	2	PS	QPNG0685AAK	PAD	1
	3		QPGG0349AAK	CUSHION,PAPER	1
	4	PE	SPHG1770A	POLYETHYLENE BAG	1
○	5	PS	QPNG0682AAK	PAD	1
○	6	PS	QPNG0684AAK	PAD	1
	7	PE	QPFG002AA	POLYETHYLENE BAG	1
○	8		QPGG0404AAK	PACKING CASE,PAPER	1
○	9		QAQG027AA	STYLE CONVERT DISK	1
			OPERATING INSTRUCTION MANUAL		
○	10		QQFGKN1600AA	OPERATING INSTRUCTION MANUAL, EN	1
○	10-1		QQTG0488A	DANSK	1
○	10-2		QQTG0489A	ENGLISH	1
○	10		QQFGKN1600BA	OPERATING INSTRUCTION MANUAL, M	1
○	10		QQFGKN1600CA	OPERATING INSTRUCTION MANUAL, MC	1
○	10-1		QQTG0489A	ENGLISH	1
○	10-2		QQTG0491A	FRANCAIS	1
○	10		QQFGKN1600DA	OPERATING INSTRUCTION MANUAL, EZ	1
○	10		QQFGKN1600EA	OPERATING INSTRUCTION MANUAL, EK XL XR XS XW	1

	Ref. No.	Part No.	Description	P/S
○	10	QQFGKN1600FA	OPERATING INSTRUCTION MANUAL, EW	1
○	10-1	QQTG0491A	FRANCAIS	1
○	10-2	QQTG0492A	DEUTSCH	1
○	10-3	QQTG0493A	ITALIANO	1
○	10	QQFGKN1600GA	OPERATING INSTRUCTION MANUAL, EF	1
○	10-1	QQTG0491A	FRANCAIS	1
○	10-2	QQTG0493A	ITALIANO	1
○	10	QQFGKN1600HA	OPERATING INSTRUCTION MANUAL, EA	1
○	10	QQFGKN1600JA	OPERATING INSTRUCTION MANUAL, EP X XM XP	1
○	10-1	QQTG0489A	ENGLISH	1
○	10-2	QQTG0495A	ESPANOL	1
○	10	QQFGKN1600KA	OPERATING INSTRUCTION MANUAL, EH	1
○	10-1	QQTG0494A	NERDERLANDS	1
○	10-2	QQTG0491A	FRANCAIS	1
○	10-3	QQTG0492A	DEUTSCH	1
○	10	QQFGKN1600MA	OPERATING INSTRUCTION MANUAL, XD	1
○	10-1	QQTG0489A	ENGLISH	1
○	10-2	QQTG0496A	中文	1
○	10	QQFGKN1600NA	OPERATING INSTRUCTION MANUAL, XT	1

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